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SECTION XXIII

History of Medicine

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[Thursday Morning, August 7]

SECTION XXIII
HISTORY OF MEDICINE

PRESIDENTIAL ADDRESS

THE HISTORY OF MEDICINE IN ENGLAND

BY NORMAN MOORE, M.D., F.R.C.P.

GENTLEMEN,—My first duty as President of this newly-formed section of the International Congress of Medicine is to welcome those professors and students of the history of medicine who are here to-day, and to congratulate them that our subject has been brought by our colleagues under the ægis of the Congress.

The founder of the study of the history of medicine in this country was Dr. John Freind: a Fellow of this College of Physicians. He was born in 1675, and was educated at Westminster School and at Christ Church, Oxford, where he took his first degree in 1698, and his M.D. degree in 1707. He died in 1728 and has a monument in Westminster Abbey.

He was one of the chief physicians of his time and had a life of varied but constant activity. His education began in one of the most famous schools of England under Dr. Busby, one of its most celebrated head masters, and was continued at the University of Oxford in the society of Christ Church, which if not then of the profoundest learning was certainly a place where ability was sure to be stimulated by the brilliant conversation of its members. He took part in editing a speech of Demosthenes and one of Æschines before he had taken his first degree, and before he graduated M.B. he had written two letters to Dr. Hans Sloane, one in English on hydrocephalus (1699) and one in Latin on some curious cases of convulsion with barking which had occurred in Oxfordshire (1701).

In 1703 he took the degree of M.B. and in that year published his *Emmenologia*, and in the following was elected Reader in Chemistry. His lectures, which are at the present day by no means uninteresting reading, were published in 1709. Freind came to know Atterbury, a senior member of his school and college, and in 1705 became intimate with another politician of that age, the Earl of Peterborough, with whom he went to Spain as physician to the Army. The war ended, he visited Italy, stayed in Rome and became acquainted with Baglivi and

other Italian physicians. When he reached home he wrote a defence of his commander entitled, 'An Account of the Earl of Peterborough's Conduct in Spain'. He was admitted a Fellow of this college on April 9, 1716, lectured here and in 1717 published Hippocrates' *De Morbis Popularibus*, Books I and III, text and translation with a commentary. Freind's kindly nature and his affection for his college appear in the dedication of this book to Dr. Richard Frewin, of Christ Church, who had encouraged his historical studies. It ends with the words :

Iamque vale, et Matris serva communis amorem.

Freind took an active part in politics on the Tory side, to which his friends Francis Atterbury, Bishop of Rochester, and Charles Mordaunt, Earl of Peterborough, also belonged. He was returned as one of the two members for Launceston in Cornwall at the general election of 1722, and spoke in the House of Commons. The return was amended and Freind unseated, but in 1725, on the death of Alexander Pendarves, Dr. Freind was returned on March 29, 1725, and sat till the end of that Parliament in 1727.

In 1722 the Government believed they had detected a Jacobite plot, for his share in which, Christopher Layer, an agent of the Pretender, was arrested, tried, convicted, and after two reprieves executed.

The Habeas Corpus Act was suspended, and on October 17 the House of Lords sanctioned the detention in the Tower, of Atterbury, Lord North and Grey, and the Earl of Ossory, and on October 26 of the Duke of Norfolk.

In the House of Commons on Wednesday, March 13, 1723, the Chancellor of the Exchequer moved that His Majesty had reasons for apprehending for high treason Dr. John Freind, a member of the House. Mr. Shippen, a Tory member, famous for his honesty and his persistence, opposed the motion, but Robert Walpole supported the motion and said that 'they had a positive oath of his being guilty of the blackest and basest treason'. Mr. Shippen replied that the motion was urged because the doctor had spoken the Monday before in the Bishop of Rochester's behalf, and that if he were to be arrested there was an end to liberty of speech. The motion was carried and Freind was sent to the Tower on March 15. The evidence produced before the Privy Council against Freind showed that Walpole's statement was altogether unjustifiable. One part of the evidence was a letter directed to Dr. Freind at his house in Albemarle Street, Westminster, which was intercepted and which I found in a parcel of uncalendared papers in the Record Office. It was from a Mr. Dolben, at Finedon, in Northamptonshire, thanking Freind for his last prescription and ending with the words :

We are in Strange agonies in the Countrey, at what you are Doing in Parliament and the More for Hearing only Flying Reports and Knowing Nothing Certain.

The only further evidence was the statement of a Mrs. Hughes, who said that she had been approved by him as a fit nurse for the Pretender's

child, after which she had gone to Rome and had lived in the Pretender's household as nurse, and had seen the doctor again on her return a year and some months later. Her signed depositions are preserved and when carefully perused leave one in some doubt as to the witness's veracity and as to whether she had ever really spoken to Dr. Freind or received, as she said she had, a small parcel of lace for the Pretender's child with letters for a Colonel Dillon in Paris.

Freind showed no dejection in the Tower and occupied his time there in writing first a letter to Dr. Mead: 'De quibusdam Variolarum Generibus', and in beginning *The History of Physick from the Time of Galen, to the beginning of the Sixteenth Century*. The work is addressed to Dr. Mead, who was admitted a Fellow of this college on the same day as Freind and between whom, though Mead was a Whig and Freind a Tory, a warm and lifelong friendship existed. At the end of the first volume Freind says:

Only give me leave, Sir, to mention (what was first in my thoughts, when I addressed this discourse to you, and what is now as warm upon my mind as it was then) how sensible I am of your singular friendship, and the general kindness shewn to me by the whole faculty, at a time, when I was apprehended to be in danger. This I shall always remember with pleasure, and this I think myself obliged in the most public manner to acknowledge.

Further investigations revealed no more of the plot; and at a meeting of the Privy Council held on June 20, 1723, the Lords of the Council resolved to release the persons who had been detained but not tried.

The warrant for bailing John Freind, Doctor in Physick, out of the Tower recites the suspension of the Habeas Corpus Act from October 10, 1722, and proceeds:

And whereas John Freind, doctor in Physick since the said tenth day of October hath been committed Prisoner in the Tower of London for High Treason by a warrant signed by one of His Majesty's Secretaries of State and still continues Prisoner there by virtue thereof, their Excellencies the Lords Justices in Council are graciously pleased to order and it is hereby ordered that His Majesty's Court of Kings Bench and the Lord Chief Justice and the other Judges of His Majesty's said Court shall and may and are hereby directed and required forthwith to bail the said Doctor John Freind taking a recognizance for him in the sum of £4,000 and from four other sufficient persons in the sum of £2,000 each and the condition of which said Recognizances shall be that the said Doctor John Freind shall appear in His Majesty's Court of Kings Bench at Westminster the last day of this present Trinity term to answer what shall on His Majesty's behalf be objected against him and that he shall appear there from day to day till he shall be discharged by the said Court and for their so doing this shall be their warrant.

The signatures of Lords Westmoreland, Carlisle, Loudoun, Stair, Portmore, Halifax, and Torrington are appended to the warrant. The prisoners were released on June 21, and were finally discharged from their bail at the end of November, 1723.

Thus it was in the ancient stronghold which still dominates the Thames near London Bridge, and from which the kings of England who lived in it wished to overawe their capital city, that the first important treatise on the history of medicine written in England was begun. The author was a man full of the learning, both literary and scientific, of his time, who had well used the best opportunities of education which England possessed, accomplished and successful as a physician, acquainted with public affairs, and the associate of all the most learned in his profession and of many of the great men of the world of letters. He wrote with a warder sitting in his room and under the immediate care of a Colonel Williamson, whose feelings to his prisoners are well shown by a letter which I found in the Record Office (State Papers: Domestic, 43, George I). It was written at 10 p.m. on June 18, 1723, and announces his delivery of Bishop Atterbury to his exile.

At parting from the man-of-war we gave three huzzas for King George and we had the compliment returned from the ship to the great mortification of the Proud Banish'd Prelate.

We parted as ill friends, as an honest Whig and a Jacobite Tory should.

After his own release Freind completed his book. M. le Clerc in France had written the history of Physic to the end of the time of Galen. Mead brought to Freind in the Tower a copy of a new edition of this work and asked him to express his opinion of it.

Freind agreed to read the book and write his opinion, saying 'but as I have not the opportunity of having much recourse to books, though indeed at present I have leisure enough, you must not expect anything which is either correct or perfect'.

He praises the original work of Le Clerc, but censures an addition made to it as superficial, and after pointing out a few errors proceeds to relate the history himself. His first volume begins with a full discussion of the Greek classical physicians after Galen: Oribasius, Ætius, Alexander Trallianus, and Paulus Ægineta. In relation to their accounts he now and then mentions cases which he had seen, discusses derived passages in Avicenna, Albucasis, and Rhazes, deals with Uranius, dwells upon Procopius and his history of the plague, shows the medical merits of St. Luke and St. Basil, and treats very fully of Harvey's discovery of the circulation. He then goes on to six Greek writers of lower rank, Palladius, Stephen the Athenian, Nonus, Michael Psellus, Demetrius Papagomenus, and Actuarius and concludes with sensible general remarks on the use of history in the study of medicine.

Freind's second volume begins with an account of the chief Arabian writers, whom he seems to have studied in Latin versions. He shows by a table how Rhazes followed the Greek writers, and after dealing with Haly Abbas gives a full account of Rhazes and then of Avicenna, whom he does not think as much of as did the Arabians, of Avenzoar the first describer of pericarditis, of Averrhoes who first noticed the immunity conferred by an attack of small-pox, and of Albucasis and his surgery,

concluding this part with an excellent summary of the Arabian additions to physic.

Then he goes on to Salernum and its doctors, beginning with Constantinus Africanus, and here considers the chemistry of Roger Bacon and makes a fine panegyric on this great man.

He describes Bernard of Gordon and then goes on to the English writers : Gilbertus Anglicus, John of Gaddesden, and John Mirfeld, with whose Breviarium he was only superficially acquainted. He then mentions Michael Savonarola as the first (1440) complete writer on the baths of Italy and goes on to the surgery of Roger of Parma, William de Saliceto, Lanfranc, and finally John of Arderne. He discusses some general subjects, Guido de Cauliaco on the Plague of 1348, the sweating sickness, the appearance of and writers on the Lues Venerea, the History of Scurvy, and says a little on the writers on gunshot wounds, and the improvements in lithotomy.

He then briefly mentions the additions to anatomy of Carpus, Massa, Sylvius, Columbus, Eustachius, and Fallopius and concludes with an account of Thomas Linacre and his great service to medicine in England. Such is the history of Freind, which well deserves and has received the commemoration of a medal in which on the reverse ancient and modern medicine join hands with the words, 'Unam facimus utramque,' while the obverse bears the head of Freind.

Freind has a monument, on which is his bust, in Westminster Abbey. It is next to that of Congreve, at the west end of the south aisle of the nave, and near the gravestone of his friend Atterbury.

The magnificent library and extensive reading of Dr. Mead make one regret that the laborious occupations of his life prevented his doing as much in the history of medicine as he wished. Of his two contributions to the subject his Harveian oration, which deals with the state of physicians in Rome, is much more interesting than his treatise on the diseases of the sacred writings.

Dr. Edward Milward, a Fellow, Censor, and Harveian orator of this college, published in 1734 an excellent account of Alexander Trallianus, written in the same method as Freind's history, and with the object of showing that the later Greek writers were not merely copiers.

Two later writers, both Fellows of this college, are commendable examples in this part of medical history, Dr. William Ogle and Dr. J. F. Payne. Ogle translated and annotated two works of Aristotle ; Payne, in his Harveian oration, dealt with the knowledge and history of Galen as a physiologist.

If the general history of medicine in England begins with Dr. Freind, that part of the study which deals with the lives of physicians undoubtedly must regard Dr. Baldwin Hamley as its founder.

He was a Fellow and generous benefactor of this college and at the annual election of our president every Fellow present to this day receives half a crown from his estate.

His *Bustorum aliquot Reliquiæ* contains the lives of some fifty physicians known to him, together with those of a few other men of the time, Strafford, Laud, Pym, Vandyke, his own father, mother, and wife. His book has never been printed and its rigidly Ciceronian style has perhaps prevented it being often read.

The feeling way in which Hamey speaks of those who died in his time shows the spirit which has always prevailed in this college. Having told the life of Mayerne, who died in 1654 at the age of 80, he gives a brief account of the first English writer on tuberculosis, Christopher Benet, 'who by a fatal leap here takes his place next Mayerne, the young man next the aged, and the last but one of the Fellows next the first. He left a piece of his work among us, a little book called, *The Porch of the Theatre of the Tabid*, dying himself, alas, of phthisis in the same porch the last of April 1655.'

Dr. Thomas Guidot, a member of St. John's College, Cambridge, published in 1677 a collection of brief lives of ten physicians who had practised at Bath, a work of no great importance, though he was a man of considerable learning as is shown by his *Historia Æsculapii*, in which he has collected from classical writers all that he could find on the cult, temples, statues, and coins of Æsculapius. The history only exists in manuscript. It reminds one of *Idea Medicinæ Veterum*, but Guidot's subject is narrower and he is not so neat a writer as Beverovicus.

Milward, who died in 1757, had in vain endeavoured to excite interest in the study of medical biography, but in 1780 John Aikin, a surgeon, brought up in a learned home and in some degree stimulated by Milward, wrote *Biographical Memoirs of Medicine in Great Britain from the Revival of Literature to the time of Harvey*. This book begins with Ricardus Anglicus and goes on to Glisson, thus including fifty-five authors. Its biographical facts are carefully collected, but the writer's knowledge of medicine was not sufficient to enable him to speak with precision of the work done by each man and of the relation of each to the knowledge of his time.

Dr. Munk, long librarian of this college, has done for the whole college from 1518 to 1825 what Hamey did for the Fellows who died in his time. His dates are drawn from the College Annals and are always accurate and his accounts of the works of the subjects of his biographies are a great help to the study of medical history. His *Roll of the Royal College of Physicians of London* has been constantly used by all subsequent writers who have alluded to physicians in England.

The oration or commemoration of benefactors of the foundation of Harvey annually delivered in this college has done much to promote the record of the lives of physicians in general and that of Harvey in particular, though of course he had no personal intention in the institution, but merely copied the annual custom of every ancient college at Cambridge.

Lastly, the *Dictionary of National Biography* in its sixty-nine volumes

contains a vast biographical contribution to the history of medicine, more exact as regards names and dates than any previous series.

Another set of contributors to the history of medicine in England are those who have written the history of particular foundations, that of the College of Physicians in relation to its duties and rights, by Charles Goodall in 1684; that of the College of Surgeons, by several of its orators; that of the Barber Surgeons and the Barbers, by Mr. Sidney Young; and that of the Society of Apothecaries, by Mr. C. R. B. Barrett.

A fourth group of historians begins with Dr. James Douglas, whose *Bibliographiæ Anatomiae Specimen*, published in 1715, is a work which will seldom be referred to in vain. This group includes all the invaluable writers of catalogues, among whose works perhaps Dr. Edward J. L. Scott's catalogue of the Sloane collection in the British Museum is the most important. That collection itself must long continue a chief source of the medical history of the seventeenth and first half of the eighteenth century. But I shall myself become a mere catalogue if I endeavour further to classify the contributors to the history of medicine in England.

I have only mentioned a very few of the chief writers before our own time on the history of medicine in England, but I should not give a fair view of the knowledge attainable in this subject if I did not point out from the subject itself something of the progress of medicine here.

Where should a man who is to write the history of medicine in England begin? The study of medicine is a part of letters as well as of science, so that in beginning the history of medicine we may fairly ask who was the first man of letters here, what was the first book? Julius Cæsar was the first man of letters we know of in this island. How great a writer, how wonderful a man, whether in thought or in action.

And here, as we are dwelling on the history of medicine, may I illustrate the way in which our study penetrates in all sorts of ways into general history? Had this greatest man of the Roman world epilepsy, as has so often been said?

On what is this idea based? On a passage in Plutarch and on one in Suetonius. Twice, says the latter, he was attacked by this disease while transacting public affairs; but there is no account of a fit, and the fainting of exhaustion due to great mental strain was more probably what took place. Who has ever seen an epileptic with a head like Cæsar's or known an epileptic of transcendent mental ability? And, applying the same observations, was not his belief in the epilepsy of Cæsar the sole origin of the idea of epilepsy in Napoleon?

Cæsar is the first author known within our four seas. What is the first book? Did he write at all here? We do not know. But we do know the first literature mentioned in England. It was the poem of Lucretius. Quintus Cicero, a very gallant and skilful officer as he showed himself when he held out against the Nervii, writing home from Britain to his illustrious brother the orator, asks what has become of the works of Lucretius then recently dead. Thus we may regard the *De*

Rerum Natura of Lucretius as the first book mentioned in this island, and remembering its medical passages, such as those on epilepsy and on jaundice, we may speak of it not only as the first book mentioned in England but as the first book treating in any way of medicine which was thought of in England.

In my account of Freind I have already mentioned the four important mediæval writers of England. The true birth of medicine here was the foundation of the College of Physicians by Thomas Linacre in 1518. He established a high standard of general learning among physicians and brought them into close relations with the world of learning and with one another. The spirit with which he animated the College of Physicians was strengthened by Caius, and the college has ever since produced a continued succession of learned men. Much of their work at first consisted in the study and translation of ancient Greek medicine, but Caius in his treatise on the sweating sickness produced the first English account of a particular disease.

From the study of the observations of nature in Hippocrates and Galen the college was directed to experimental research, of which the first great result was Gilbert's discovery of the magnetism of the earth, and the next Harvey's discovery of the circulation of the blood.

Then came Glisson, the first English pathologist. His *Tractatus de Rachitide* is the first in England in which the clinical features and the morbid anatomy of a disease are placed side by side and in which, so far as the knowledge of the time allowed, the whole pathology of the disease is discussed.

The book has another interesting feature in that, though originated and completed by Glisson, the investigation was for some time pursued by eight Fellows of the College of Physicians, who thus formed the first pathological society of England.

Sydenham was not a morbid anatomist like Glisson, and had he lived in our time might even have belonged to the school who despise study in the post-mortem room and declare that no more is to be learnt there, but he was the first man in the world of medicine since Hippocrates to endeavour to discover general laws about the prevalence, the course, and the treatment of disease from observation of living patients. I have often thought that the public-health men might justly regard him as the first worker in England who sought conclusions on disease, and particularly on epidemics, such as those which they present to us in their reports at the present day.

Matthew Baillie carried further than any one, and I think with more lucidity than Bonetus or Morgagni, the correlation of symptoms and of post-mortem appearances. He showed that the old notion of polypus of the heart was untenable, he came very near to the discovery of the anatomy of enteric fever, he perceived before microscopes the distinction between the hardness of tissue in scirrhus of the breast and cirrhosis, then also called scirrhus of the liver. His book encouraged the study of

morbid anatomy among both physicians and surgeons throughout England.

Sir William Jenner, following the method of Baillie, demonstrated the morbid anatomy of enteric fever. Sir Samuel Wilks and Samuel Gee were other workers of the same school in our own time.

Baillie had himself been encouraged in his studies by his two great relatives John Hunter and William Hunter. The former of these was not the first great surgeon of England, for he had been preceded by the learned Charles Bernard, who observed that the kidney might be removed with safety and that secondary new growths had a tendency to appear after what seemed the complete operative removal of cancer of the breast, and by Percival Pott, who first accurately explained the paralysis caused by disease of the bodies of the vertebræ; yet John Hunter established surgery as a scientific study and permanently raised it from a mere discussion of method to the position of a true part of medicine, and by the example of his work and the continued teaching of his great museum made every worthy surgeon a man of science. He was the true predecessor of Lister.

Having thus mentioned a few of the great names which occur in the progress of medicine in England, I must not detain you further than to point out how well the list of papers to be read in this section demonstrates the many directions which the history of medicine may take, the vast variety of learning which may be brought to bear upon it, the great interest which it has in relation to every part of the practice of medicine and surgery, to pathology, to all the allied subjects, and to the general study of history.



[Thursday Morning, August 7]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

ST. LUKE AND VIRGIL

BY F. MELIAN STAWELL, NEWNHAM COLLEGE, CAMBRIDGE

BEFORE beginning my paper I should like to say how much I value the honour the Congress has done me in asking me, a student from the ranks of another army, to put before them certain views of mine about the nationality and work of St. Luke. May I say also that I think their acceptance of my subject a testimony to that width of interest which has always distinguished the Faculty, and which was indeed a peculiar gift of the writer before us, one who, as I hold, was himself a student of medicine?

In New Testament criticism no position is undisputed, but the following view has the support of many scholars,¹ and to save time I will assume here that it is correct. One and the same writer, then, using of course older materials on occasion, composed first the Gospel and then the Acts; he never gives his name, but he refers to himself in 'Acts' whenever he uses the form 'we'; he was St. Paul's physician as well as his friend, and was indeed 'the beloved physician' of whom the Apostle speaks in his letter to the Colossians. Before either the Gospel or the Acts were written Jerusalem had been destroyed by the Romans, in A. D. 70, and St. Paul, according to tradition, had been martyred earlier still, under Nero.

Further, it is universally agreed that the writer, whoever he was, was a Gentile, and not a Jew.² But what sort of Gentile was he? It is usually assumed that he was a Greek, but the object of this paper is to show that in all probability he was a Roman, and that his Roman origin gives the key to much in his work. It was common enough in the early Empire for Romans to write in Greek, even if they only wrote for themselves, as Marcus Aurelius did in his *Meditations*. No doubt Luke's vocabulary indicates that he had read the Greek writers on medicine.³ But that

¹ e.g. Renan, Ramsay, and Harnack, save for some doubts suggesting an earlier date.

² This indeed is certain, if he was the Luke of Colossians, for there he is distinguished from 'those of the circumcision'. Col. iv. 11, 14.

³ See Hobart, *The Medical Language of St. Luke*. Hobart, however, overstated his case. Harnack, *Luke the Physician*; Zahn, *Einleitung in das N.T.* ii. 437 (1900); Lagarde, *Psalterium iuxta Hebræos*; Art. 'St. Luke' in *Enc. Bibl.*

would be essential for any one in his day who wished to study the science at all seriously. And though his vocabulary is sufficiently Greek, there are significant peculiarities in his construction, and nothing betrays a writer more surely than his construction. And when Luke is not idiomatic he is either Latin, or he is copying from the very curious Greek of the Septuagint, that translation of the Bible made by Alexandrian Jews who were not entirely at home either in Hebrew or in Greek. The task of investigating Luke's language is, it is true, a delicate one, because in the Hellenistic Greek of Luke's generation certain words and phrases had crept in which look as though they owed their origin either to Latin or to Hebrew, and yet, whatever their origin, they had by this time become the common property of the vernacular. Such words and phrases we must, of course, discount. But there remains enough and more than enough to make us more than suspicious of Luke's origin. Our suspicions are first awakened by the fact that the Latin colour of the sentences is most constant where Luke is writing most independently—I mean, in the chapters from the Acts where he seems to be speaking from his own knowledge, and in the prologue. I exclude the prologue to the Gospel because I believe that to be carefully modelled on the prologue of the medical writer Dioscorides. This was suggested long ago by the German scholar Lagarde, and to my mind the likeness between the two passages is strong enough not to be overlooked in weighing the evidence for Luke's medical knowledge.¹

The Latin turn in Luke appears, to take first my weakest instances, in his fondness for constructions which, though perfectly correct in Greek and though increasing in Hellenistic Greek, are still, then and always, much nearer to the genius of the Latin language. For instance, it is characteristic of Latin to use the relative, wherever it can, as a mere connective between two main sentences. This is the first thing a boy learns when he begins to write Latin prose. Instead of writing 'After doing this, Cæsar left the place', he must write, 'Which when he had done Cæsar left the place.' Similarly an Englishman would say, 'Lydia

¹ Dioscorides, *Materia Medica*, *init.* Πολλῶν οὐ μόνον ἀρχαίων ἀλλὰ καὶ νέων συντάξαμένων περὶ τῶν φαρμάκων σκευασίας τε καὶ δυνάμεως καὶ δοκιμασίας, φίλτατε Ἀρειε, πειράσομαί σοι παραστήσαι, μὴ κενὴν μηδὲ ἄλογον ὁρμὴν με πρὸ στήνδε τὴν πραγματείαν ἐσχηκέναι, διὰ τὸ τοὺς μὲν αὐτῶν μὴ τετελειωκέναι, τοὺς δὲ ἐξ ἱστορίας τὰ πλείεστα ἀναγράφαι. 'Albeit many, not only in former days but in our own time, have set down what concerns the preparation and powers and testing of drugs, I will endeavour to show thee, most dear Areius, that I have followed no vain or foolish impulse in this matter, seeing that some of them did not complete their task, and others for the most part wrote from hearsay.' Later on Dioscorides contrasts what he is doing with the work that is not based on *eyewitness*: ἅπερ ἐστὶ τεκμήρια οὐκ αὐτοψίας, ἀλλὰ τῆς ἐκ παρακουσμάτων ἱστορίας. Compare also the *κράτιστε* used by Luke with the τοῦ κρατίστου Λικανίου of Dioscorides. The likeness to the Gospel prologue appears even in a translation: "Forasmuch as many have taken in hand to set forth a declaration of those things which have been fulfilled among us, even as they delivered them unto us which from the beginning were eyewitnesses and ministers of the word: it seemed good to me also, having traced the course of all things accurately from the first, to write unto thee in order, most excellent Theophilus, so that thou mightest know the certainty of those things wherein thou hast been instructed."

listened, and the Lord opened her heart,' and a born Greek would usually put it in much the same fashion. But a Roman would say, 'Lydia listened, *whose* heart the Lord opened,' and that is exactly how St. Luke puts it (Acts xvi. 14; out of the *We*-document). How naturally this Romanizing construction rises to the tip of St. Luke's pen can be seen in the first fifteen verses of Acts xxviii, where it occurs six times. Nowhere else in the New Testament have we so incessant a use as this.¹ So again, with what grammarians call the absolute use of the participle, 'this being so', 'this having been said'. Luke will employ it far more freely than any other New Testament writer, e.g. eleven genitive absolutes in the first twenty verses of Acts xxvii, compared with *one* instance in a similar passage of narrative from St. John's Gospel, more than four times as long (John xviii, xix; verse 22 of xviii).

The presumption raised by these characteristics is greatly increased when we find instances of Latinism in Luke which, so far as I know, are hardly to be paralleled in any Greek author of any period at all. It is distinctive of Latin as of German to keep a finite verb to the end of the sentence, so much so that you will often get two of them at once piled up on each other at the close. Such a 'heavy sediment of verb', as a modern grammarian calls it, is foreign, comparatively speaking, to Greek as to English. We say, 'He parted from those whom he loved,' and so might any Greek. But a Roman says, 'He from those whom he loved parted.' Now St. Luke ends the prologue to the Acts thus, 'Until what day he, having given commandment through the Holy Ghost unto the apostles whom he had chosen, was taken up.' I cannot believe that if Greek had been Luke's mother-tongue he could ever have written that. If I may borrow a medical phrase, it seems to me 'diagnostic' of Latin.

Again, Latin has a very familiar phrase which may roughly be rendered, 'it cannot be but,' or more literally and more clumsily, 'it cannot be done so as not to,' *fieri non potest quin*. Now in the passage from the Gospel that we may translate, 'it cannot be but offences come' (xvii. 1), Luke uses a phrase² which is almost a literal translation of the Latin idiom, and which happens to be so extraordinary in Greek that Moulton, doing his best for it, admits a genitive case is used where a nominative would have been more correct.³ Surely a damaging admission for Luke's Greek grammar. There is a similar well-known difficulty in the Greek of a phrase from Acts x. 25. But the phrase—ἐγένετο τοῦ εἰσελθεῖν τὸν Πέτρον—loses its difficulty if we may suppose that Luke was thinking in Latin and translating into Greek the common Latin idiom, 'it happened so that (Peter came in),' *accidit ut Petrus introiret*.

Further, I do not see how we can explain the way in which Luke

¹ The nearest approach to it appears to be in Colossians and Ephesians, *init*. But there the relative sentences are rather subordinate and descriptive.

² Ἀνεκδοτόν ἐστι τοῦ μὴ ἐλθεῖν τὰ σκάνδαλα.

³ *Gr. of N.T. Gk.*, Proleg., p. 217 (1908).

copies certain un-Greek phrases of the LXX if we are to suppose him a born Greek. It might be natural enough, no doubt, that he should imitate it in a general way so as to give a Biblical colour to his narrative, but it could not be natural for him to select and emphasize phrases which, as they stand, would put the teeth of any Greek on edge. And this is just what he does. It is a mannerism, and a bad mannerism, of the LXX to translate a typical Hebrew idiom by the phrase 'and it was and', e.g. 'and it was and he went'.¹ Now Luke adopts this mannerism and makes it his own. It does not occur elsewhere in the New Testament except two or three times in Matthew and Mark all told, and yet it would not surprise us so much in them as they evidently spring from a Semitic source; it does not occur, so far as we know, outside the Bible at all; it is even more strange and awkward in Greek than it is in English, and I submit we can only understand its employment by a writer of Luke's ability and grace if we suppose that he learnt more of his Greek from the LXX than he did from his mother's lips.²

Scholars have tended to assume that Luke must have been a Greek if he was versed in medicine, because far the greater number of medical men at that time were Greek. But we ought not to forget the great Latin name of Celsus, Aurelius Cornelius Celsus, who was either of Luke's own generation or of the one before him.³ It is quite likely, no doubt, that Celsus never practised for pay—was not a professional physician in the strict sense—but it is just as likely that Luke never did so either. In fact, I think this is plainly suggested by the passage at the end of Acts where he associates himself with St. Paul in the work of healing among the inhabitants of Malta.⁴ That Luke should study medicine and yet not devote his whole life to it, would be entirely in harmony with the Roman attitude towards science: they seldom realized all that it demanded. And the attitude of the semi-amateur would account to my mind at once for Luke's obvious interest in the healing art and his credulity about miracles, resurrections, and supernatural deaths.

Finally, it is important to notice that Luke's name is not Greek at all, it is Roman; it is indeed the shorter form of Lucanus, a surname in the great family, the *gens Annæa*, to which Seneca, Gallio, and Lucan all belonged. This in itself is not conclusive, as some Greeks did adopt Roman surnames,⁵ but taken in connexion with what goes before it may

¹ ἐγένετο καί: sometimes the καί is omitted.

² Hawkins, *Horæ Synopticæ*, p. 37 (1909); Moulton, op. cit., pp. 16 seq. Luke seems actually to remodel passages from his sources in order to bring in the phrase. Cp. Luke ix. 28 with Mark ix. 2, Matthew xvii. 1, and Luke xi. 14 with Matthew ix. 32, xii. 22. He is still under its influence in the Acts, though there it is modified so as to bring it nearer to current Greek. The trick of 'was' with the present participle, probably also learnt from the LXX, appears also in the *We*-passages of Acts (e.g. xvi. 12).

³ His *floruit* is usually placed at A.D. 50.

⁴ Acts xxviii. 8–10. See Harnack, *Luke the Physician*, p. 15.

⁵ e.g. Galen, physician to Marcus Aurelius, took the name of Claudius.

be significant. If St. Luke was a cadet of that great house it would explain why he was left at liberty in Rome when his friend St. Paul was in prison, why he knows so much about Gallio's temperament, and even, perhaps, how it came about that Seneca's writings show, as they do, so strong a Christian character. I would add also that Philippi, where Luke appears to have been stationed, was a Roman colony.¹

The hypothesis of a Roman origin accounts for the evident sympathy with the Romans felt through all the Lucan writings, the desire to put them in the best light, the intense pride in Roman citizenship and the great name of the Cæsar. It is significant to contrast the curious external tone of disparagement in which Luke speaks of Athens,—the 'school of Hellas' to a Greek,—adorned with the work of a Pheidias, as of a place given over to idols and empty talk. There is something here, I cannot but feel, of the true Roman contempt for art and conversation in comparison with conduct and government.² Further, and this perhaps is the real point of my paper, a Roman origin fits in admirably with the view, so ably supported by Harnack, that the real theme of the Acts is the travelling of the Gospel under the guidance of the Holy Ghost from Jerusalem to Rome. I think we may go further and say that Luke the Roman, first of all the New Testament writers, foresees that Rome is to be the centre of the Christian community, the hearth of the new home. And it seems to me that in thinking over his book Luke was struck, as a cultured Roman could hardly fail to be struck, by the resemblance between the work of St. Paul, as he knew it, and the theme of the founding of Rome that dominates Virgil's great religious epic of the *Æneid*. This resemblance lay in the nature of the case, in the facts themselves, but the recognition of it has had its full share in determining Luke's general plan and choice of incident. I have called the *Æneid* religious advisedly, for its greatness lies largely in the sense that Æneas is an instrument chosen by a Divine power to accomplish a work that goes far beyond himself, the work of founding a great civilization, of 'bringing the gods to Italy' (*Æn.* i. 6). To fulfil this work Æneas is driven out from his fatherland and sent as a wanderer over the earth. Troy, his native city, is doomed: he sees the 'dreadful faces' of the gods turned in wrath upon her. She is utterly destroyed, and it is not on her soil that her walls are to rise again. From land to land Æneas wanders, knowing nothing beyond the fact that somehow, somewhere, he is to lay the foundations

¹ Acts xvi. 10–12. The *We*-passages begin again on the return journey by Philippi, xx. 5. Harnack supports the theory of a special connexion with Antioch. This may be, but it is also possible that the later tradition, e. g. in Eusebius (*H. E.* iii. 4), may have arisen from a confusion with the Lucius who was one of the first missionaries thither. Acts xiii. 1; Rom. xvi. 21.

² Cp. Acts xvii. 16–21 with Virgil, *Æn.* vi. 845 ff.:

Excudent alii spirantia mollius aera . . .

Orabunt causas melius . . .

Tu regere imperio populos, Romane, memento—

No doubt there is also a reference to Dem. xliii. 8.

of a new and greater kingdom, urged on by dreams and portents that move him forward when he would fain rest, telling him time and again that this is not the place, that he must go further, leaving those he loves and who love him, yet comforting him always with the assurance that he will reach the goal at last. And he does reach it, but not to see with his own eyes the completion of his work, only to have a prophecy and vision of it. He is to struggle with the people of the Italian land to which he comes: for three years he is to dwell among them, teaching them how to live and mould themselves into a mighty nation (i. 265). And then he is to die: his death is not described, it is foreboded. The *Æneid* ends with Æneas at his task in Italy.

Now let us turn to the Acts. Step by step, scarcely knowing what he does, St. Paul is pressed out and onward to leave Palestine and carry the Gospel abroad. 'Depart, for I will send thee far hence to the Gentiles.' Jerusalem is doomed. The prophecy has gone forth: reiterated with infinite pity in the Gospel, it is felt all through the Acts, from the first speech of Stephen with its rejection of the Temple to the stern concluding 'one word' of St. Paul in the last chapter. And as in the *Æneid* so in the Acts, all through the wanderings we have mysterious signs and visions signalling every step, even as the tongues of fire played round the heads of the chosen, and the divine flame licked the hair of Æneas's son, marking Paul's path by miracles, suffering him not to preach where he was at first minded, sending him to Cyprus where he meets Sergius Paulus and takes the Roman name of Paul, calling him from Asia to Europe by the dream-voice out of Macedonia, whispering to him that when these things are ended he 'must also see Rome'. It is very easy from a modern point of view to be contemptuous of all these signs and wonders, all this thaumaturgy—I cannot myself accept them as facts, but it seems to me that literally true or not, Luke recounts them rather as a poet would and as Virgil does, not caring much about their actual occurrence or consistency in detail, but caring infinitely about what they symbolize, the truth that great men of action are driven forward by something in them that is more than they can fully understand. 'A man', said Cromwell, 'never goes so far as when he knows not whither he is going.' And as in the *Æneid* so in the Acts, the effect of all the perils and wanderings on sea and land is given by concentrating on one perilous voyage, and describing it in detail. It has always been a puzzle on any theory why the writer of the Acts spends so much time on the shipwreck, one long chapter and a half out of a total twenty-eight. I follow the school that holds the narrative to be based by Luke himself on his own diary made at the time.¹ But why does he think it worth while to embody all these trivial notes? Because, I believe, with the Virgilian example before him, he would feel them not trivial but momentous in their symbolism. Virgil's Æneas, shipwrecked and flung on a strange land, sustains the hearts of his followers

¹ This does not involve accepting the absolute accuracy of every detail, e.g. it is very hard to believe that the sailors were actually without food for fourteen days.

by his belief that they cannot die till they have fulfilled their mission. 'God will end our troubles: we must go to Italy' (i. 203, 206). Cheered by him they take food and drink, and the divine mother of Æneas appears with words of comfort, telling him that all his ships will be saved. He and his comrades make a fire on the shore, and the strange people, after certain doubts, receive them with the utmost kindness, honour them as half-divine, and give them all they need. Just so, St. Paul in the height of the tempest comforts the terrified sailors by his vision of the Angel of God, 'Fear not, Paul; thou must stand before Cæsar: and lo, God hath given thee all them that sail with thee.' Just so, he heartens them and makes them take food, and, just as in the *Æneid*, they are cast on an unknown land and the strange inhabitants,¹ in spite of certain misgivings at the first, are won by them in the end and overwhelm them with kindnesses and honours. And, just as in the *Æneid*, from their resting-place after three months of winter, the travellers pass on to Sicily and from Sicily to the spot near Cumæ where Æneas landed at first, and from there to Rome at last. To one who had the *Æneid* in his mind,—and a Virgilian soul himself, if ever there was one,—these coincidences could hardly fail to seem strangely significant: he might well feel that no more fitting conclusion could be found for his own work. And the Virgilian example would suggest the retention of the first person plural in the narrative, the 'We' that has been so often discussed.² Virgil, following Homer, knew that in an epic of adventure and wandering the personal note so given is invaluable.

Thus, after a lifetime of toil and travel St. Paul, like Æneas, finds his way to the goal, and there, like Æneas, has two years before the end in which to lay the foundations of the kingdom he was sent to establish. His death is not recounted, but the whole of the farewell scene at Miletus is a foreboding of the end. And in the light of that, the closing lines of St. Luke's work have a most noble dignity and fateful calm. 'He dwelt two whole years in his own hired house, preaching the Kingdom of God with all confidence, no man forbidding him.' There it stops, but the very stress on the two years of freedom, coupled with the warnings that have preceded, bids us of itself know the doom that followed. Small need to recount it in detail. St. Paul's work was done, and the work, as for Æneas, was the supreme concern. Yet I make no doubt that beside the model of the Virgilian reticence, there was another reason for Luke's silence here, a reason that bears witness not so much to the man of letters in him as to the Roman statesman. His desire is to go forward with his

¹ This explains the peculiar stress on *βάρβαροι*, xxviii. 1, 4. The following references may be useful: *Æn.* i. 2-7, 81 ff., 174 ff., 204 ff., 263 ff., 331 ff., 385, 390 ff., 539 ff., 597 ff.; ii. 622 ff., 681; iii. 1-45; iv. 193, 222 ff.; v. *init.*; vi. 2.

² I do not wish to deny that Luke may also have been glad thus to indicate his presence as an eyewitness. I would add that I admit a certain likeness between Luke and Josephus. But might not this be due to rivalry on the part of the latter (*Jos., Vita*, xlii; *Bell. Jud.* xxix. 3, *init.*; *Acts* xxvii. 24; xxviii. 11; *Gospel, init.*)?

dead master's work, to unite Rome and Jerusalem, Jew and Gentile, in one universal Christian world. He will not imperil this by embittering the hearts of his Christian readers with the tale of how their mightiest leader was martyred at Rome itself under Roman orders. It would be most unfair to see in this reticence a mark of servility or cowardice. On the contrary, nothing is more remarkable than the extraordinary courage and deathless confidence shown by Luke in writing his great work when he did. Paul, his master, is dead : Rome has killed him, she who should have received him as her second founder. Persecution has been raging in the empire. To the writer of the *Apocalypse*, Rome is the harlot drunk with the blood of the saints, and the Roman Empire the monstrous beast that must be utterly destroyed. It must have seemed to many, as seem it did, that Paul's dream of fellowship with the Gentile world was the lying dream of a false prophet : that history had decided for the Judaizers in that fierce struggle between Jewish Christianity and the broader Christianity of Paul which almost tore the infant Church in sunder. Luke, the Roman, has no fear for himself and no misgiving for the future. Cautious, bold, and wide of outlook, he will teach his countrymen that the criminal they slaughtered was their second Æneas, he will teach the Jews that the Balaam at whom they sneered was their second Moses, come to lead them as a Deliverer¹ from the fetters of a dying law and a doomed city into a promised land of freedom, order, and loving-kindness.

I have said that I think he may be a member of Seneca's family. If so, it is a pleasing fancy to set him in spirit at the head of his famous race, and contrast with the Lucan of whom Shelley sang, the poet and revolutionary ' by his death approved ', our Luke, whose life and work approve him, one who was at once physician, man of letters, statesman, and saint.

¹ Compare the whole speech of Stephen, Acts vii, with Gal. iii-v.

[Thursday Morning, August 7]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

THE TEMPLES, HOSPITAL, AND MEDICAL
SCHOOL OF COS

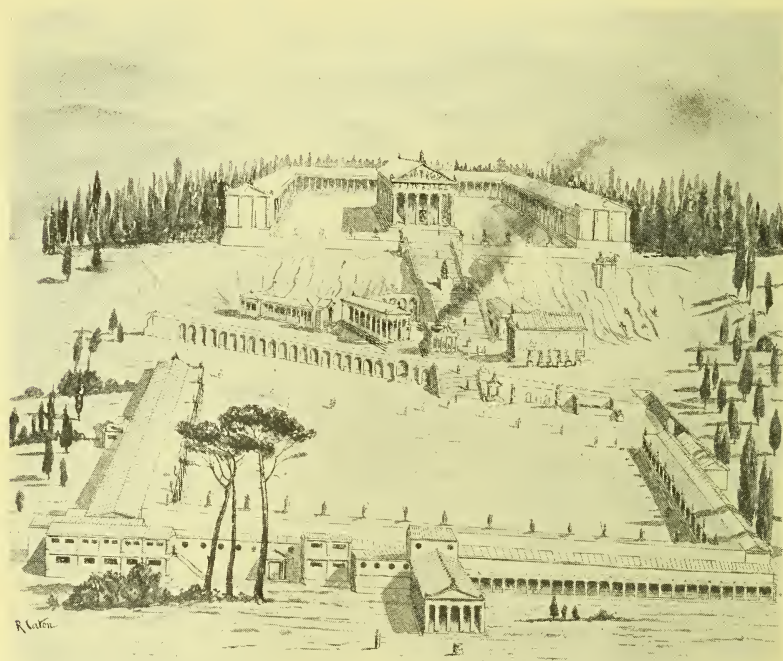
BY RICHARD CATON, M.D., LL.D.

THIS ancient shrine, the scene of the labours of Hippocrates, is situated about two miles from the modern town of Cos. The site had been so changed by earthquakes, by the growth of vegetation, by the destructive work of the lime-burner, that all trace of the magnificent Coan sanctuary had disappeared, and the association of the place with Asklepios had remained absolutely unknown for many centuries. Near the foot of a range of lofty hills a plot of ground known to the natives of the island as Παναγία τῆς Τάπρου was a few years ago suggested by Messrs. Paton and Hicks, the authors of *The Inscriptions of Cos*, as probably the locality of the temple.

Professor Rudolf Herzog of Tübingen commenced some years ago to investigate this site, and has been rewarded by the discovery of highly interesting remains of the ancient temple and precinct. To him and to his fellow workers belongs the whole credit of the excavation.

The temple precinct consists of three terraces arranged in a series of steps on the side of the mountain. The lowest of the three seems to have been approached by a gate or propylæa, containing a stairway. This lowest terrace presented a three-sided stoa or portico about 128 metres long by 63 broad. The eastern side of the portico had adjacent to it an extensive series of baths, originally, no doubt, the work of Greek builders, but altered and extended in Roman times. A number of ancient earthenware pipes brought water to the baths and fountains probably from the spring of Hippocrates, and from the celebrated red-water spring, a couple of miles higher up in the mountains. The north side of the quadrangle contained many rooms on two or three floors, probably employed as consulting and waiting rooms and operating rooms, dispensary, library, and rooms for teaching purposes. Here Hippocrates and his pupils may have written the careful notes of cases which have come down to us, for Cos was a great medical school. Here, probably,

Hippocrates kept the skeleton which he used and which he gave later to the Oracle at Delphi. In the propylæa or gateway were large tanks and an aqueduct, probably for initial ceremonial ablutions. A portion of the western side was devoted to sanitary accommodations. Here also may have been the culinary department, for diet was thought by the Coan School to be very important. Here also, perhaps, was the *δείπνητήριον* or refectory. The south side of this great stoa or quadrangle consisted of a lengthy buttressed wall supporting the second terrace, pierced by certain flights of steps, and presenting several drinking-fountains between the buttresses. Within the sheltering stoa or cloister were many inscribed



wall-slabs in marble, votive tablets, health maxims, and records of honours gained by Coan physicians. The area of this stoa was doubtless a palaestra for gymnastic treatment. About the centre of the second terrace there stood a huge altar, reminding the visitor of that at Pergamon, though on a smaller scale. This spot is interesting as being the scene of the fourth Mime of the Alexandrian poet Herondas.

To the west of this altar stood an ancient Ionic Prostyle temple, 16 metres in length and 8 in breadth, divided into naos and pronaos. On the south side of the naos, the floor contains a rectangular coffer or cyst composed of great slabs of marble, each a foot thick. The coffer is about 5 feet long, 4 in breadth, and 3 in depth. The massive block,

level with the floor, which forms the lid is pierced in the centre by an aperture about 6 inches in diameter. Professor Herzog believes this to have been a treasure chamber. The extreme difficulty of removing the massive lid in order to deposit or remove treasure makes this hypothesis somewhat improbable. It is more likely to have been the lair or den of the sacred serpents, from which those reptiles emerged when fed by priests or patients with the 'popana' or cake offerings. In the fourth Mime of Herondas, the votaries of Asklepios, after sacrificing on the altar, turn to the serpents' lair and introduce into it their offering. Probably, also, a bronze tripod stood adjacent on which incense and bloodless sacrifices were offered to the god in his snake incarnation. This temple, which was probably at an earlier time the shrine of Asklepios (before the erection of the great temple on the third terrace), may afterwards have been utilized as a thymele or sacrificing place to the serpent deities, as probably was the case in the tholos at Epidaurus.

East of the great altar stood a second temple, 16 metres by 10, the original dedication of which is unknown, but in Roman times the emperors were probably worshipped there. It is Doric peripteral. Both temples appear to be not later than the fifth century B.C., but have been reconstructed, probably after overthrow by earthquake. East of this latter temple extends a long irregular building which may have been partly the shrines of various deities and partly rest- or shelter-houses for the sick. South of the Doric temple was a large exedra or semicircular seat, similar to those at Epidaurus. South of the Ionic temple is a building reconstructed in Roman times and perhaps intended for a 'Lesche' or for a priest's house. South of the great altar a broad and lofty flight of steps leads up to the third or highest terrace. On the summit, facing this great stairway, stood the large temple of Asklepios, a Doric peripteral structure dating only from the third century B.C. Its dimensions were 33 metres by 18. The columns were $1\frac{1}{4}$ metres in thickness. A great marble figure of Asklepios with a serpent stood at the south end of the temple within. On the south, east, and west sides the temple was surrounded by a great stoa measuring 108 metres by 70. The east and west arms of the stoa were doubtless the abaton or sleeping-places for men and women respectively, where incubation was carried on; the sick spent the night on their couches hoping for illuminating visions from the god, for visits from the sacred serpents, and for miraculous healing.

These open colonnades are the counterparts of the abaton at Epidaurus. This curious idea of incubation as a means of healing still survives at Tenos and other Greek islands, as Dr. Rouse of Cambridge has pointed out.

Offerings were placed on tables and altars in the abaton. Evening prayers were recited. The abaton was lofty and airy, entirely open on one side. Whatever other agencies were employed for the sick, they certainly had the benefit of an abundance of pure mountain air during the night.

Only the foundations of all these buildings now exist, but architectural

fragments remain which render it not difficult to reconstruct in imagination the original fabrics. Naturally, but few remains have been found of the splendid works of art in bronze and marble which once decorated this celebrated place of healing.

The views from the temple commanding the mountains and plains of Cos, the blue Ægean, the islands and the hills of Asia Minor, are most striking. The Sanctuary has no special theatre or stadium, those of the town of Cos being easily accessible. The sacred grove of cypresses surrounded the upper part of the enclosure on three sides.

Higher up on the mountain were two springs. That termed Burinna or the fountain of Hippocrates is specially remarkable. A tunnel of Mycenaean architecture leads to a curious stone-built subterranean chamber, shaped like a champagne bottle: an open central fountain and circular seats occupy most of the floor, and a curious aperture in the wall above is arranged probably for some ritual or religious ceremony.

The Kokkino Nero or red-water spring was and still is believed to be of great efficacy by the Coans.

The religious life of the ancient Greeks probably presented nothing more solemn or more beautiful than the ritual of Asklepios (unless it be that associated with the Eleusinian Mysteries). The worship of Asklepios was the most enduring form of paganism and gave much trouble to the ancient Christian missionaries.

A health temple like this presented a scene striking in its peace and beauty. The situation was one of remarkable charm. Mountain, plain, sea, and islands, surrounded it. Rich vegetation, beautiful flowers, works of the most supreme art, sculpture, painting, architecture, were displayed on every hand. The gods of the pagan pantheon presented in their most attractive guise suggested the brightness and hope of human life to the young and to those who were recovering. Asklepios himself, Epione, Hygieia, Panakeia, Iasos, Podaleirios, and Machaon were there as helpers of man's need, while for the old and for those whose sickness was incurable the calm and dignified forms of the gods of Eleusis, Demeter, and Persephone suggested patience and the hope of an after life, pure and spiritual, free from all bodily infirmities.

The artists who produced these great works had in their minds a strong feeling of the religiousness and sacred happiness, as Walter Pater says, of a life spent in relieving pain and averting death, and a deep sympathy with the sorrows and sufferings of man.

The priest-physicians were commonly men of education and philosophic training, who taught the skilled culture of life, advocating simplicity and temperance, and the love of all that was beautiful in nature, art, and literature.

The daily routine of treatment, by baths and exercises, by medications and diet, was varied by solemn religious processions of the white-robed priests and priestesses, with music of flute and cithara, the burning of sweet-smelling incense, the singing of Orpheic hymns and pæans, solemn

prayers and sacrifices. One of these prayers has come down to us in the writings of Ælius Aristides, a priest of Asklepios : ' Oh, ye children of Apollo, who have oft stilled the waves of suffering among men, and lighted the lamp of safety for those who sojourn by sea and land, though your glory be great, accept this prayer which in sleep and vision you have inspired. I pray you order it aright according to your loving-kindness for men. Preserve me from sickness, endue my body with such health as may suffice it to obey the soul within, that I may pass the days of my life unhindered and in peace.'

Special sources of mental interest were supplied ; such tragedies as those of Sophocles and Euripides or the comedies of Aristophanes, played at frequent intervals in the theatre, would so immerse the sick and the convalescents in pathos or in merriment as to banish for the time individual troubles. The studious man would repose in the exedrae and dream over manuscripts, histories, plays, or poetry, from the library.

Such a routine of life would tend to a calm hopeful condition of mind eminently helpful to recovery from minor forms of illness. Added to all this, the influence of Hippocrates during his life and after his death must in this Asklepieion have been great and beneficial. His intense earnestness, his devoted and lifelong efforts to help the sick and the maimed, to lessen suffering, to learn and to teach new truth and to discard ancient error, were of priceless value. Probably, while he revered the supreme gods, he believed more in rest, pure air, exercise, diet, the use of remedies, and in the curative powers of nature, than in the direct interposition of Asklepios or of the sacred serpents.

Here it would seem that medicine perhaps for the first time arose as a great and beneficial agency, based on a practical and a scientific foundation, for the relief of the sufferings of mankind. How great is the debt we owe to these Greek priest-physicians, and especially to Hippocrates the Father of Medicine !



[Thursday Morning, August 7]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

DER URSPRUNG DER SYPHILIS

VON PROFESSOR KARL SUDHOFF, LEIPZIG

MEINE HERREN! Wäre der Beweis 'e consensu gentium' in Fragen der Wissenschaft zulässig, so wäre die amerikanische Herkunft der Lustseuche entschieden gewesen. Die schon mehrmals im Laufe der Jahrhunderte allgemein akzeptierte und wieder ebenso allgemein verworfene Ansicht,¹ die Syphilis, von der man in den Jahren 1495 und 1496, also 2–3 Jahre nach der Entdeckung Amerikas, in ganz Europa zu reden begonnen hatte, sei mit der ersten Reise des Kolumbus von den Bahamas oder den Grossen Antillen eingeschleppt worden, war seit zwei Jahrzehnten wieder in Kurs gekommen und schliesslich wieder ziemlich allgemein geglaubt worden. Aber auch in der Historik der Epidemien entspricht nicht alles den Tatsachen, was die Spatzen von den Dächern pfeifen.

Neues Tatsachenmaterial hatten die Anhänger des wiedergeborenen Amerikanismus² für den Import von den Antillen nicht beizubringen vermocht. Geschickte Kombinatorik und bisher nicht hierzu verwendetes Stützmaterial aus benachbarten Kulturgebieten halfen diesem empfindlichen Mangel ab, vor allem scheinbare Uebereinstimmungen im ersten Auftreten der Syphilis mit modernen epidemiologischen Gesichtspunkten, deren direkte Uebertragung auf die Geschichte der Syphilis zu Ende des 15. Jahrhunderts die Einschleppung einer neuen Krankheit in eine diesem Virus gegenüber völlig undurchseuchte Bevölkerung anzunehmen Veranlassung gab.

An sich ist gegen ein solches Vorgehen nichts Ernstliches einzuwenden. Bewusst oder unbewusst überträgt jeder Forscher von heute die wissenschaftlichen Gedankenströmungen des Tages in seine Auffassung und Wertung der Vergangenheit mit hinein, oft zum Vorteil für das Verständnis ferner Zeiten, namentlich auch in der Geschichte der Volkskrankheiten. Nur darf man dabei die Tatsachen selbst den modernen Anschauungen zuliebe nicht beugen und nicht strecken.

Die direkte Behauptung, dass die Syphilis durch die paar Matrosen des Kolumbus, der im März 1493 von Haiti aus heimkehrte, nach Europa

übertragen worden sei, begegnet uns zuerst 1539 in greifbarer Gestalt oder, wenn man sehr viel guten Willen zu der Prüfung mitbringt, im Jahre 1525 — immer noch ein volles Menschenalter nach dem Ereignis! Obendrein sind die Zeugen entweder direkt als 'befangen' abzulehnen oder ihre Zeugnisse waren einer Behörde in völlig unkontrollierbarer Weise preisgegeben, die an der Behauptung der Einschleppung aus Amerika ein starkes merkantiles Interesse hatte. Es ist für einen Historiker von Sauberkeit und Akkuratessse geradezu penibel, mit solchen 'Beweisen' zu hantieren. —

Dass die Krankheit immer und immer wieder als 'neu' bezeichnet wird, von Laien wie Aerzten, beweist natürlich ebensowenig, dass sie aus Amerika herüberkam, wie die Ablehnung dieser Hypothese auf der anderen Seite mit Notwendigkeit die Folgerung der zweifellosen Syphilis-verseuchung der antiken Welt ergibt. Zwar entbehrt der kürzlich unternommene negative Beweis,³ dass die vortrefflichen antiken Aerzte die Lues als Krankheit *sui generis* klinisch bestimmt erkannt hätten, wenn sie damals schon die Menschen auf horizontalem Wege infestiert hätte, völlig der Triftigkeit. Die antike Medizin litt auf dem Gebiete der Infektionskrankheiten an ausgesprochener Sehschwäche. Nicht einmal der doch weit einfachere Zusammenhang von Gonorrhöe und Epididymitis wurde von ihr erfasst. Aber a priori ist zuzugeben, dass, so gut die Lepra die Nordküsten des Mittelmeerbeckens bis in nachchristliche Zeit verschonte, auch die Syphilis *vielleicht* ihren Einbruch in diese Regionen erst später vollzog. Der literarische Beweis, dass die Syphilis in Hellas und Rom schon herrschte, ist jedenfalls dank den Untersuchungen von v. Notthafft-Drerup und Bloch einstweilen als gescheitert zu bezeichnen. Er wird besser zurückgestellt, bis auf dem Wege der pathologisch-anatomischen Untersuchung zweifellos präantiker, antiker und frühmittelalterlicher Knochenreste mehr Sicherheit in diese Frage hineingetragen ist.

Auf dem Wege der Knochenstudien hat man den Beweis für präkolumbische Syphilis in Amerika schon in der Hand zu haben geglaubt; aber die sorgfältige Untersuchung des gesamten vorhandenen Materials durch den Beauftragten der Smithsonian Institution Hrdlička hat vollständig mit diesem Wahne aufgeräumt.⁴ Kein sicher präkolumbischer Knochen der Neuen Welt ist bisher mit zweifellosen Zeichen der Syphilis gefunden worden; im Gegenteil scheint die furchtbare Häufigkeit der Lues in Indianerbegräbnisstellen des 17. und 18. Jahrhunderts zu dem Schlusse zu zwingen, dass die Krankheit erst durch die Europäer zu dieser unberührten Bevölkerung verschleppt worden sei. Obendrein mehren sich zusehends die Beweisstücke für alte Kulturzusammenhänge zwischen den Euphratländern und Zentralamerika⁵ und die Knochendokumente aus Prähistorik und Frühhistorik der Alten Welt beginnen uns Aussagen zu bringen, welche sich eher nach der Seite der Syphiliskonstatierung in vorkolumbischer Zeit der Alten Welt neigen. Noch scheinen mir Knochenfunde zu fehlen, welche *völlig ausschliesslich* die Diagnose 'Knochenlues' zulassen, wenn auch erfahrene Kenner, wie

Lannelongue und Gangolphe⁶ dies behaupten. Um so sicherer sind Befunde zur Stelle, die man, wenn heute an einer frischen Leiche zur Kognition gekommen, ohne Zaudern für Syphilis erklären würde.

Direkte Beweise für eine Einschleppung der Syphilis aus Amerika im März–April 1493 sind also nicht vorhanden, ebensowenig für ihr Vorhandensein in Amerika vor dem 12. Oktober 1492, als die Schiffe des Kolumbus zum erstenmale die Bahama-Inseln erreichten oder vor dem 28. Oktober, an dem er auf Kuba landete.

Wie steht es aber mit den indirekten Beweisen?

Man tut von amerikanischer Seite immer so, als wenn dabei gar nichts Verwunderliches wäre, dass die Einschleppung einer neuen Krankheit, von der die Mannschaft des Kolumbus befallen worden wäre und die vom 16. Januar 1493, dem Tage der Abfahrt von Haiti, bis zum 4. März, dem Tage der Landung des Schiffes des Kolumbus in Lissabon, zum 15. März in Palos, zum 31. in Sevilla und zum Ende April in Barcelona, Zeit gehabt hätte, sich weiter zu entwickeln — als wenn dabei gar nichts Verwunderliches wäre, dass diese prätendierte Einschleppung von den Aerzten in Palos, Sevilla und Barcelona oder in Bayona an der galizischen Nordküste, wohin Pinzon verschlagen worden war, übersehen worden wäre. Mir scheint dies geradezu ein Gewaltakt, umsomehr als man gleichzeitig von schweren Syphilisformen spricht, die als schlimme Initialepidemie einer neu aus den Tropen eingeschleppten Krankheit sich von den spanischen Häfen aus im Land verbreiteten und im arragonesischen Süditalien, namentlich in Sizilien und Neapel, abermals eingeschleppt wurden. Dort sollen sie von neapolitanischen Buhl dirnen auf das Heer des Franzosenkönigs Karl VIII. mit seinen in strenger Manneszucht zum Kriege erzogenen französischen Kerntruppen⁷ und den schweizerischen und deutschen Landsknechtekontingenten übertragen worden sein, mit denen sie sich beim Rückmarsch nach Mittel- und Oberitalien und schliesslich nach Frankreich, der Schweiz und Deutschland bei der Entlassung der Söldner verbreiteten, ohne dass eine direkte Verschleppung von der spanischen Südostküste nach Frankreich und nach der Riviera di Ponente und di Levante ausgeschlossen wäre. So will's der neueste Kanon, und von alledem soll nichts von den damaligen Aerzten gemerkt worden sein, ehe die Syphilis in furchtbarem Wüten in Neapel das siegreiche Heer durchseuchte! Ja, genau besehen, auch dann noch nicht!

Die behauptete unbeachtete Einschleppung und Weiterverbreitung in den spanischen und italienischen Hafenstädten ist aber an sich schon wenig wahrscheinlich und um so weniger naturgemäss, je heftiger das initiale Auftreten gewesen wäre. War man doch in Spanien und Italien seit mehr als einem Jahrhundert auf die Einschleppung pestartiger Krankheiten auf dem Seewege aufmerksam geworden, die man mit Hafensperren und Quarantänen zu bekämpfen gelernt hatte; befand man sich ihnen gegenüber doch völlig schon auf dem Standpunkte einer antikontagionistischen Hafenpolizei.⁸ Trotzdem überall dies völlige Uebersehen? ? ! — Credat Iudaeus Apella ! —

Aus Spanien selbst verlautet bestimmt kein Wort vor dem 18. Juni

1495 aus Barcelona, und was da verlautet, besagt genau das Gegenteil von dem, was die amerikanistische Theorie verlangt. Am 18. Juni 1495, als Karl VIII. schon seit einigen Wochen auf dem Rückmarsche sich befand, trifft in Barcelona der eben mit dem medizinischen Doktorhute gekrönte Dozent der Philosophie aus Pavia, Nicolò Scillacio⁸ auf Syphilitische in erheblicher Zahl, und die Aerzte der spanischen Hafenstadt erklären ihm, die Krankheit sei seit kurzer Zeit aus Südfrankreich kommend, bei ihnen aufgetreten.⁹ Es lässt sich ferner durch die Reiseaufzeichnungen eines deutschen Arztes der Beweis erbringen, dass man im September 1494 in Barcelona von der Lues noch nichts wusste, dass in ganz Spanien im Herbst und Winter 1494 und zu Anfang des Jahres 1495 noch kein Mensch von der Lues spricht.¹⁰ Irgend auffällige Krankheiterscheinungen einer um sich greifenden Seuche waren also bis in den Beginn des Jahres 1495 in Spanien nicht beobachtet worden!

Und die soviel besprochene schwere Syphilisepidemie zu Neapel im März bis Mai 1495? Sie ist ein völlig inhaltsleeres 'historisches' Gerede!

Sorgfältige Untersuchungen in den neapolitanischen Archivbeständen und die Durchmusterung aller Chronikenberichte lassen daran keinen Zweifel. Man kennt die Syphilis dort nicht vor dem Beginn des Jahres 1496 als neue Krankheit, wie auch im übrigen Mittel- und Norditalien eine allgemeine Syphiliskenntnis vor dem Frühling 1496 nirgends sich durchsetzt, teilweise, wenn nicht ausschliesslich, durch das Büchlein des Scillacio mit dem 'novus morbus, qui nuper a Gallia defluxit' auf der Titelseite, das am 9. März 1496 die Presse verliess.¹¹ Und für die furchtbare Dezimierung des unter dem Herzog von Montpensier und dem Connetable d'Aubigny zurückgelassenen Besatzungsheeres ist nicht etwa die Syphilis, sondern der Typhus im Winter 1495-6 und im Frühjahr und Sommer 1496 als Seuchenursache nachweisbar.¹²

In Deutschland war zu gleicher Zeit, als Nicolò Scillacio in Barcelona die erste Kunde von der Syphilis erhält, schriftlich fixiert und seinem Lehrer nach Pavia weitergibt, am mittleren Rheinlauf die Syphilis als solche schon bekannt. Johannes Trithemius will sie schon im Jahre 1493 dort kennen gelernt haben (in Sponheim, Erzbistum Mainz),¹³ ebenso der Strassburger Wundarzt Hieronymus Brunschwig im nämlichen Jahre,¹⁴ der Zisterzienserprior Johann Nibling sogar schon zu Anfang der neunziger Jahre des 15. Jahrhunderts in der Heidelberger Gegend.¹⁵ Jedenfalls kommt die Syphilis auf dem Reichstage zu Worms, der am 26. März 1495 eröffnet worden war, zur Sprache, und als neues Zeichen göttlichen Zornes über die sündige Menschheit drohende Verwendung in einem Reichtagsedikt, das am 7. August vollzogen wurde¹⁶ und gedruckt in alle zum Reiche gehörigen Lande Versendung fand, alle Welt, vor allem die Stadtverwaltungen, mit der neuen schweren Krankheit und Plage bekannt machend, 'genannt die bösen Blattern,' was die wenig spätere lateinische Uebersetzung mit *malum Francicum* wiedergibt, die in Frankreich und Italien schon umlaufenden Volksbezeichnungen *grosse*

verole und *mal franzoso* gleichzeitig festlegend. Am 16. August tut Maximilian noch ein Uebriges und warnt in einem besonderen Schreiben seine gute Stadt Augsburg vor dem freien Umherlaufen der Schweine in der Stadt, das die neue Pest weiter zu verbreiten geeignet sei.¹⁷

Wenige Monate später setzt unter der Wirkung des Gotteslästerediktes vom 7. August 1495 mit seinen drakonischen Strafandrohungen durchs ganze westliche und südliche Reich und nach Norden weiter-schreitend, eine durchgreifende Abwehraktion ein gegen die Träger dieser 'neuen Krankheit', die man auf das eine Wort der 'bösen Blattern' hin überall als schon vorhanden feststellt und die jedermann sofort erkennt. In Anknüpfung an alte Lepra-Abwehrmassregeln weist man allenthalben die Syphiliskranken aus, soweit sie nicht Stadteingesessene sind; die Einheimischen werden nach Tunlichkeit isoliert. Von Besançon bis Nürnberg und von Strassburg und Mainz bis Wien sind in wenigen Wochen und Monaten, noch ehe der Winter 1496-97 einbricht, die Landstrassen voll Luetischer, zu denen Bordelldirnen, Bordell- und Badeknechte ein starkes Kontingent stellen, ein Ergebnis, das als Ganzes betrachtet, fast allein schon genügen würde, eine Syphilisepidemie vorzutäuschen und zur Weiterverbreitung der Krankheit, trotzdem man jetzt auf sie aufmerksam geworden war, in allerhöchstem Grade fördersam beitrug.¹⁸ Im Frühjahr und Sommer 1496 setzt eine Syphilisliteratur¹⁹ in Deutschland und dem kulturell und politisch damit verbundenen Norditalien ein, die ohne diesen hiermit aufgedeckten Zusammenhang zu einer der auffallendsten Erscheinungen in der medizinischen Weltliteratur aller Zeiten gehören würde.

Um nun endgültig die 'Syphilisinitialepidemie' 1495-1500 in Deutschland und Oberitalien aufzuklären, habe ich zunächst in einer recht beträchtlichen Anzahl mittel- und süddeutscher Städte das sämtliche in Frage kommende direkte Aktenmaterial auf diese Frage hin geprüft und, wo ich auch meinen Spaten einsetzte,²⁰ überall das gleiche Ergebnis zutagegefördert: von einer grossen, heftigen Syphilisepidemie kann keine Rede sein. Allenthalben, wo überhaupt noch Stadtakten vorhanden sind aus dieser Zeit, zeigt sich ein plötzliches Interesse, allenthalben finden sich Syphiliskranke in grösserer oder geringerer Zahl; man ergreift die geschilderten Abwehrmassnahmen zum Schutze der eigenen Einwohner nach dem Rezept:

' O heiliger Sankt Florian,
Verschon' unser Haus, zünd' andre dafür an '

und sorgt damit für gehörige Weiterverschleppung des Leidens. Allenthalben setzt ein Strohfeuer der Vielgeschäftigkeit gegen die Syphilis ein, das nach 2-3 Jahren, oft schon nach 1 Jahre, in sich selbst zusammenfällt, da sich die von hoher geistlicher und höchster weltlicher Stelle mit allen Schrecken einer furchtbaren Gottesgeissel ausgestaffierte Krankheit zwar als höchst beschwerlich, aber als zunächst relativ ungefährlich herausstellt und durchaus nicht als völlig neu, auch mit einer gleichzeitig

bekannt werdenden Kur in einigen Wochen zu beseitigen ist. Schliesslich beschränkten sich die Massnahmen der deutschen Städte darauf, ihre stadteingesessenen Syphilitiker und die Dienstboten ihrer Bürger, wenn sie an Lues erkrankten, in besonderen kleinen Anstalten (Franzosenhäusern, Blatternhäusern) dieser Kur auf Stadtkosten unterziehen zu lassen. Trotz massenhafter Fehldiagnosen im positiven Sinne infolge der künstlich unter allerhöchster Protektion grossgezogenen Syphilidophobie treffen wir allenthalben auf nur mässige, selbst kleine Zahlen von Kranken und von ausgegebenen Gulden im Stadtbudget — nirgends, selbst nicht annähernd Zahlen wie etwa bei einer auch nur ganz leichten Pestepidemie — kurz, Zahlen wie heute! —

Gehen wir vollends nach Frankreich und England, so herrscht absolute Stille im literarischen Blätterwalde, auch in den Chroniken, soweit sie nicht direkt vom deutschen Imperium abhängen (Franche Comté, Flandern). Die Krankheit findet sich auch dort allorten, aber irgendeinen Eindruck macht sie dem Volke dort nicht, auch den Gelehrten nicht. Nur die Behörden treffen Ausweisungs- und Isolierungsmassregeln, in Frankreich wie in Schottland u.s.w. — Dass es überhaupt solche syphilisstillen Länder gibt, beweist die völlige Hinfälligkeit des so offensichtlich aufgebauchten Seuchencharakters. Die behauptete schwere Initial-epidemie wäre auch dort von den Chronisten mit gebührender Ausführlichkeit und Vordringlichkeit geschildert worden. Sollte sie sich auf Deutschland in ihrem Toben beschränkt haben? Dies zugeben, heisst die 'Syphilisepidemie' am Ende des 15. Jahrhunderts in einem Sarg von glatten Unmöglichkeiten begraben! —

Wie war denn nun wirklich der Hergang? Wie rang sich allmählich die Syphiliskenntnis durch?

Im Mittelpunkt der alchemistischen Studien des Abendlandes, die im 11. Jahrhundert beginnen und am Ende des 13. zur Schaffung der reifsten Früchte dieser Arbeit vor dem 16. Jahrhundert, zur Schaffung der Werke des Pseudo-Geber führten, standen von Anfang das Quecksilber und das Antimon und der Arsenik. In diesen Alchemistenkreisen, auf deren nahe Beziehungen zu den Chirurgen Italiens (und später auch Frankreichs und Deutschlands) schon hingewiesen worden ist²⁰, hatten die therapeutischen Bedürfnisse von jeher die gleiche Beachtung gefunden, wie die metallurgischen: die Schlacken der Krankheiten aus dem Körper zu treiben, galt ebensosehr als Ziel wie die Erzeugung des Goldglanzes, die Veredelung der Metalle. Was half das Gold ohne dauerhafte Genussfähigkeit des Körpers? —

Seit dem 12. Jahrhundert datiert denn auch schon die Verwendung des regulinischen Quecksilbers, dem man durch Beimengung organischer Stoffe (Speichel und Fette) seine 'Schärfen' genommen hatte, zu Einreibungen, denen man bald nicht nur lokale, sondern auch konstitutionelle Wirkung beimass, da wie bei innerer Anwendung von Quecksilber Darmausscheidungen, so bei perkutaner Speichelfluss als erwünschte humoral-

therapeutische Effekte beobachtet wurden. Durch die Praxis der Jahrzehnte, sicher durch mehrere Menschenalter, lernte man aus dem grossen Heere der chronischen Hautaffektionen bei der Anwendung der Quecksilbersalben eine Gruppe ausscheiden, die durch solche Einreibungen günstig beeinflusst, ja zur völligen Heilung gebracht wurden. Man lernte weiter erkennen, dass diese Wirkung weit sanfter und gleichmässiger und trotzdem noch sicherer eintrat, wenn man die offenen Stellen der Exantheme vermied und 'gesunde' Handteller, Fussteller, Kniekehle, Sternalgegend, seitliche Brustpartien u.s.w. als Applikationsstellen wählte. Soweit ist diese Kenntnis gediehen, wo sie uns literarisch fassbar entgegentritt,²⁰ zu Ende des 12. und zu Anfang des 13. Jahrhunderts bei den italienischen Chirurgen. Auch die notwendige Lokalbehandlung der Mundschleimhaut war schon damals allgemein im Gebrauch, trotzdem man den Speichelfluss gerade aus theoretischen Gesichtspunkten als das Heilsame glaubte ansehen zu müssen, als den Ausscheidungsweg für die kranken Säfte.

Auch in die Kreise der Internisten dringt diese therapeutische Erkenntnis ein und in der Mitte des 14. Jahrhunderts treffen wir zum ersten Male auf eine zusammenfassende Benennung dieser chronischen Hautaffektionen, die durch universelle Quecksilber-Einreibungskur zur Heilung gebracht werden können, aus dem grossen Heere der Scabies, d. h. der chronischen Ekzeme und verwandter Hauterkrankungen, als *Scabies grossa*.²¹

Der ganze Hergang wird uns verständlich, wenn wir uns erinnern, dass die Zeit noch gar nicht so fern liegt, wo man bei späten syphilitischen Erkrankungsformen eine probatorische Inunktionskur anwendete und wo überhaupt der günstige Effekt einer Schmierkur als der bündigste Beweis für Syphilis galt. Der Schluss wird also auch schwer abzuweisen sein, dass ein Kulturmilieu, in dem die universelle Quecksilberschmierkur gegen eine konstitutionelle Krankheit mit Hautdeckenbeteiligung zur Entwicklung und vollen methodischen Ausbildung kommen konnte, von der Spirochaetenseuche nicht frei gewesen sein kann. Dass man das gleiche Mittel auch bei der altbekannten Lepra anzuwenden versuchte, ist nur selbstverständlich, dass kein Erfolg dabei erzielt wurde, nicht minder. Das Ergebnis konnte nur eine schärfere Scheidung der durch Quecksilber heilbaren Chronizität von der leprosen sein.

Doch gehen wir weiter. In Italien, wo man um die Wende des 12. zum 13. Jahrhunderts mit der Lepra auch in ärztlichen Kreisen mehr sich zu beschäftigen Veranlassung fand, scheint dieser Scheidungsprozess begonnen zu haben; jedenfalls ist dies Wissen mit der italienischen Chirurgie im 13. und 14. Jahrhundert nach Frankreich übertragen worden, wenn es dort nicht vorher mindestens in gleicher Weise gepflegt worden war, wofür die spanisch-südfranzösischen Kenntnisse in der alchemistischen Medizin eines Arnald von Villanova immerhin eine Stichprobe bilden. Jedenfalls verschiebt sich im norditalienisch-südfranzösischen Kulturstrich des 14. Jahrhunderts das Fortschreiten der Erkenntnis nach Westen.

Statt oder neben der Bezeichnung *Scabies grossa* hatte sich in Südfrankreich die Bezeichnung *Variola grossa* eingeführt, die als *grosse vérole* dort in weitere Volkskreise gedrungen war²² und sich festgesetzt hatte. Im südlichen Frankreich wurde nun aber auch noch die letzte Klarheit gewonnen, der letzte Schritt getan, indem man im 14. Jahrhundert, vielleicht schon früher, den Verbreitungsweg der Lues durch den Geschlechtsakt erkannte. Was man dort vorher schon von der Lepra geglaubt hatte, lernte man auf die *Scabies* bzw. *Variola grossa* einengen. In dem Milieu der Dirnen, Zuhälter und Lebemänner und ihrer getreuen, vertrauten und scharfsichtigen Berater, der Meister der Chirurgie (und der Barbieri), reifte diese Erkenntnis, und sie ist auch auf dieses auf Gewinn und Verderb miteinander verbundene Milieu im wesentlichen beschränkt geblieben. In dieses Milieu lässt uns ein Blick tun ein Gerichtsverhandlungsprotokoll aus Dijon vom Jahre 1463, wo eine Dirne bekennt, sie habe sich einen unwillkommenen Ansturm dadurch vom — Leibe gehalten, dass sie den Gelüstigen erklärte, sie sei am *gros mal* erkrankt! Das war also in der Mitte des 15. Jahrhunderts und wohl schon früher, wie der geniale Charles, genannt Daremberg, bereits vor Jahrzehnten durchschaut hat²³, die in diesem Milieu der Dirnen, Zuhälter, Lebemänner und Barbier-Chirurgen, das auch heute noch seine besondere Sprache in Sexualibus besitzt, die gebräuchliche Terminologie. Von diesem *gros mal* der Lustdirnensprache Südfrankreichs stammt auch in gleichen Kreisen Oberitaliens die Bezeichnung 'Mal' *franzoso*, dessen Rezepte — Erdrach syrup und was man sonst später gegen Lues in Anwendung zog — ein Bologneser Wundarzt sich in sein geheimes Rezeptbüchlein aufzeichnen liess.²⁴ Auf dieses Dirnenmilieu und seine Berater aus der niederen Chirurgie blieb aber im wesentlichen dieses neue Wissen auch fernerhin zunächst beschränkt. Nur wenig davon sickerte in weitere Kreise durch, soviel nur, dass man dunkel davon wusste und sich dessen erinnerte, als im Jahre 1495–6 das Wort von der neuen Krankheit aus Gallien durch die Welt lief, und Erfahrene, wie der populäre Dichter Veronas, Giorgio Sommariva²⁵ und der Veroneser Arzt Natale Montesauro²⁶ erklärten: 'Das ist ja die Krankheit, die das Volk *Mal franzoso* nennt!' — Die Bezeichnung hatte sich also ein halbes Jahrhundert zum mindesten in Oberitalien in Kurs erhalten.

Scabies grossa

Variola grossa

grosse vérole

gros mal

Mal franzoso

Das ist der Entwicklungsgang, den die Bezeichnung genommen hat; alles andere lässt sich mit Leichtigkeit hiervon ableiten! —

Dass in dem 'Mal franzoso' zunächst nichts Abträglichen liegen sollte, ist klar, dass die Volkswut Italiens nach dem Einfalle Karls VIII. der Bezeichnung eine bissige Pointe zu geben suchte, verständlich. Der

Historiker der Medizin wird aber gerne heute zugestehen, dass das 'Mal français', der 'Morbus gallicus', die 'Franzosenkrankheit' mit Recht ein Bürgerrecht in der Geschichte der Heilkunde beanspruchen dürfen. Bedeuten sie doch einen *Ehrentitel für die Chirurgie des südlichen Frankreichs*, die im 14. und 15. Jahrhundert einer heimtückischen Krankheit, die am Mark der Menschheit frisst, in denkender Beobachtung die Maske vom Gesichte riss und so zuerst den Weg zu ihrer Vermeidung und Bekämpfung freimachte. —

Vielleicht aber hat sie auch noch ein Zweites getan, sie allein oder in Gemeinschaft mit den italienischen, gleichfalls alchemistisch gebildeten Chirurgen — und das führt mich zu einem letzten Einwand der Lues-amerikanisten gegen das vorkolumbische Alter der Syphilis in Europa, zur 'Hilflosigkeit der Aerzte', ein Einwand, der nur bei völliger Verkenntung aller historischen Tatsachen möglich war. Denn die Sache verhält sich schnurgerade *umgekehrt*.

Abweichend von allen anderen 'neuen' Krankheiten, auf welche die medizinischen Praktiker erst entsprechende Heilmittel und -methoden unter Anwendung des Analogieschlusses übertragen und probeweise zunächst in Verwendung ziehen, abweichend hiervon tritt die Syphilis gleichzeitig mit ihrer Heilmethode auf, und zwar mit *der* Heilmethode, die auch heute noch — abgesehen von der öfter schon versuchten und immer wieder verlassenen Arsenmethode — als die sicherste gilt und mit geringen Modifikationen nach abermals vier Jahrhunderten noch in Geltung steht. Obendrein stellt diese gleichzeitig mit der Syphilis überall — in Nürnberg, in Augsburg, in München wie in Mailand, Verona und Perugia — greifbar in die Erscheinung tretende Syphilistherapie ein völlig Singuläres dar, ohne Beispiel in der übrigen Therapie, völlig unbekannt der Antike und daher auch glattweg abgelehnt von dem hochmütigen 'Rinascimento', ein völlig Neues, das sich nachweisbar erst in den letzten vier Jahrhunderten vorher ausgebildet hatte, in seiner ganzen Eigentümlichkeit mit seinem vollen Drum und Dran als fertige Methode, die sich ganz unmöglich in zwei, drei Jahren entwickelt haben konnte, weil sie bei keiner andern Krankheit wirkliche Heilresultate zu geben vermag. —

Aus dem Westen kommt diese Kenntnis nach Oberitalien im 15. Jahrhundert, die Kenntnis von der Krankheit und die Kenntnis von ihrer Kur, wie Sommarivas 'empirici ab occidente' eindeutig dartun, also aus Südfrankreich, was freilich nicht völlig ausschliesse, dass sie mit Lanfranc und Genossen einst aus Italien dorthin überpflanzt worden war, etwa zu Ende des 13. Jahrhunderts. Vielleicht ist also der Ruhm der Entdeckung der neuen Krankheit und des ersten Beweisstückes einer spezifischen Therapie zwischen Frankreich und Italien zu teilen. Möglich selbst, dass die alte Maranentheorie noch einmal in neuer Form wieder auflebt, dass die arabisch-jüdischen Aerzte, 1492 aus Spanien verjagt, zwar nicht die Syphilis, aber die Quecksilberschmierkur in ihrem Felleisen mitbrachten und auf die allenthalben von ihnen ebensogut wie in Spanien

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SECTION XXIII
HISTORY OF MEDICINE
INDEPENDENT PAPER
LEPRA IM MITTELALTER

VON PROFESSOR GEORG STICKER, MÜNSTER I. W.

DIE Legende von der Herkunft des Aussatzes für das mittelalterliche Europa und insbesondere für seine nordischen Länder lautet : Die Lepra hat sich bei den Feldzügen des Pompeius in den levantinischen Ländern in die römischen Heere eingenistet, wurde von diesen nach Italien verschleppt und hier allmählich zur Volksplage. Als die Römer die Länder nördlich von den Alpen eroberten, war die Plage hier unbekannt. Je mehr nun aber die römischen Soldaten und Söldner die Völker Galliens und Germaniens durchdrangen und sich mit ihnen vermischten, um so mehr teilten sie ihnen die ansteckenden Krankheiten mit, die sie selbst hatten, darunter die Lepra.

Diese Legende vermischt zweifellos Falsches mit Wahrem. Wahr wird die Mitteilung chronischer Ansteckungskrankheiten durch die römischen Heere an andere Völker sein. Dass unter jenen Krankheiten aber die Lepra eine wesentliche Rolle gespielt habe, ist von vornherein unwahrscheinlich. Die Lepra ist keine Wanderseuche, sondern eine stehende Seuche. Die Ansteckung mit Lepra ist nicht so leicht und wird nie so rasch offenbar, dass Kriegsheere sie als sichtbares Danaergeschenk hinterlassen oder Ansiedler sie als umsichgreifendes Uebel mitbringen.

Unter den Völkern Galliens und Germaniens, die Caesar und Tacitus geschildert haben, scheint Lepra und ähnliches Siechtum in der Tat nicht bestanden zu haben. Im fünften Jahrhundert nach Christus spätestens ist sie zweifellos in Gallien vorhanden ; im siebenten Jahrhundert hat sie am Rhein und an der Mosel ihre Herde. Zu Ende des neunten Jahrhunderts, als die halbtausendjährige Bewegung der Völkerwanderung in Europa endlich abgeflutet war und als die abgetriebenen, der Heimatlosigkeit müden germanischen Horden sich ihre heutigen Wohnsitze einrichteten, da ist die Leprakrankheit so weit verbreitet unter ihnen, dass die seit dem Jahre 549 in Gallien hier und da nachweisbaren Absonderungen der Leprösen in Feldhütten und Aussatzhäusern immer häufiger geschehen und nun so rasch zunehmen, dass es in Frankreich zu Anfang des neunten Jahrhunderts 1500, in der Mitte des dreizehnten Jahrhunderts

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3600, um dieselbe Zeit in allen Christenlanden über 30,000 Hospitäler für Aussätzige gibt.

Aussätzige, das heisst Ausgesetzte, Ausmätkige sind im 12., 13., 14 Jahrhundert zweifellos gleichbedeutend mit Leprösen, die Unterscheidung zwischen Sondersiechen und anderen Siechen geschieht ganz streng.

Aber vorher war es nicht so. Die Diagnostik, auf Grund deren die Trennung der Leprösen von anderen Siechen mit chronischen Hautausschlägen, Verwüstungen der Körperoberfläche und Verstümmelungen der Glieder und Sinnesorgane geschieht, hat sich erst sehr allmählich herausgebildet und die Sage von der ungeheuren Verbreitung der Lepra im mittelalterlichen Abendlande beruht zum Teil auf der irrigen Annahme, dass alles, was man damals für aussätzig erklärte, Lepra gewesen sei. Milbenkrätze, Räude, Mutterkornkrankheiten, Erfrierungen, zufällige und künstliche Verstümmelungen und Entstellungen waren nicht seltene Veranlassungen für die Absonderung; ausserdem eine Krankheit, die unter den Krankheitsnamen der Scabies, des *Malum mortuum*, des *Malum Sancti Meeni* und *Maïni*, später der *Pustula grossa* die verschiedensten Veränderungen an Haut und Knochen und anderen Geweben setzte und höchst wahrscheinlich unsere heutige Syphilis ist.

Nach der Zeit des Schwarzen Todes nimmt die Lepra in Europa überall rasch ab und spielt beinahe keine Rolle mehr. Drei Ursachen mögen an diesem auffallenden Wandel schuld gewesen sein: das massenhafte Aussterben der Leprösen durch die Pest, die heute ebenso unter den Tuberkulösen aufräumt da wo sie längere Zeit sich einnistet; die immer schärfer werdende Aussonderung fremder Kranken aus den Leprosenhausanwärtern, insbesondere die Betonung der 'neuen Krankheit' zu Ende des fünfzehnten Jahrhunderts und die Absonderung der damit Behafteten in die Franzosenhäuser; endlich die fortschreitende Säkularisierung der klösterlichen und kirchlichen Pflegeanstalten zu gunsten der städtischen Krankenhäuser und anderer Zwecke, wobei die letzte Razzia unter den Pseudoleprösen geschah.

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SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

MASSAGE IN MELANESIA

By W. H. R. RIVERS, M.D., F.R.S.

WHEN I was working in the Solomon Islands with Mr. A. M. Hocart¹ it was our custom, whenever possible, to accompany the native practitioners of the healing art on their visits to their patients. On one of these occasions the treatment consisted chiefly of abdominal massage carried out, so far as I could tell, just as it would have been by a European expert. On questioning the woman who was the subject of the treatment, it seemed that she was suffering from chronic constipation, and if the matter had not been gone into more fully, it might have been supposed that the Solomon Islanders treated this disease according to the most modern scientific therapeutics. Further inquiries, however, brought out the fact that the manipulations we had observed had had as their object the destruction of an octopus which, according to the native pathology, was the cause of the woman's troubles. She was held to be suffering from a disease called *nggaseri*² caused by the presence of an octopus in the body. On inquiring into prognosis, we were told of a belief that the tentacles of the octopus tended to pass upwards and that, when they reached the head of the patient, a fatal result ensued. The object of the treatment was to kill the octopus, and in the case we observed treatment had already been carried out for several days, and the octopus, which had at first been very large, had now become small and was expected soon to disappear altogether. This result, however, was not ascribed so much to the mechanical action of the manipulations as to the formulæ and other features of the treatment which accompanied the massage.

On another occasion I observed the treatment of a case of supra-orbital neuralgia. The brow was kneaded carefully for a time and then a fold of the skin was caught and an action carried out as if something were being drawn through the skin, and the invisible object called *tagosoro* thus extracted was blown away. I asked the leech³ to apply his treatment for

¹ As members of the Percy Sladen Trust Expedition.

² i. e. octopus.

³ Mr. Hocart has suggested that this old word should be used as a technical term for the practitioners of that rude art which can be called neither medicine nor magic, but lies somewhere between the two.

tagosoro on my own forearm, and kneading manipulations exactly like those of our own massage were carried out till by a sudden movement he showed me how he would have caught the *tagosoro*, if it had been there, and would have blown it away. Here again a superficial inquiry would have seemed to show the existence of therapeutical massage indistinguishable from our own, applied to conditions to which, according to our present ideas, it is well adapted. It was only through systematic inquiry that it was discovered that the ideas underlying the treatment were wholly different from our own and that the whole process rested upon a magico-religious basis.

My object in bringing this feature of Melanesian therapeutics before you is that it shall serve as an example of a difficulty which confronts that department of the history of medicine which attempts to deal with origins. A few years ago I should have had no hesitation in regarding this Melanesian practice as an example of the growth of a rational therapeutical measure out of a magical or religious rite. I should have supposed that these practices of the Solomon Islanders were designed originally to extract the octopus or the *tagosoro* from the body, and that it would only be necessary to slough off what we regard as the superstitious aspect of the practice to have a true therapeutical measure. I should have regarded the Melanesian practice as one which has preserved for us a stage in the process of evolution whereby medicine evolved out of magic, and, as a matter of fact, I believe that the vast majority of my anthropological colleagues, at any rate in this country, would still be fully satisfied with this view.

Many students of anthropology, however, are now coming to see that human institutions have not had so simple a history as this view implies, and that many of the cases formerly supposed to show stages in a process of a simple and direct evolution are rather the outcome of the blending of peoples and their cultures. In the case before us a little thought will show the possibility that Melanesian massage, as we now find it, may have had a very different history. It is possible that massage, much in the form in which it is practised among ourselves and so many other peoples of the earth, was introduced into Melanesia by an immigrant people, and that the beliefs in the octopus or the *tagosoro* are merely the outcome of attempts to account for the success of the new treatment on lines suggested by the pathological ideas of the indigenous people. The process would be like that among ourselves when any new treatment, if sufficiently successful to attract attention, is explained according to the current pathology and therapeutics of the day. A case analogous to that of my Melanesian example would be the orthodox explanation of the successes of Christian Science, which is based on the pathological distinction between organic and functional disease and the therapeutical ideas summed up in the term 'suggestion'. Before we accept Melanesian massage as an example showing us a stage in the evolution of a medical remedy out of a magico-religious rite, it is necessary to consider as an alternative hypo-

thesis whether it may not have been the result of a blend between an introduced therapeutical measure and an indigenous belief according to which the diseases of mankind are due to animals or other agents which have found their way into the human body.

I cannot attempt here to deal fully with the evidence which would enable us to weigh the two hypotheses against one another, for the subject can only be treated adequately in conjunction with the study of many other features of culture. I can now point only to two considerations. One is that true massage such as is practised by ourselves apparently exists in Polynesia.¹ It is, of course, possible that deeper inquiry would show that, underlying Polynesian massage, there are ideas which give it a special character, just as was found to be the case with the massage of the Solomon Islands, but the way in which the Polynesians use massage as a restorative suggests that the practice of this people is a true therapeutical measure thoroughly comparable with our own. True massage thus seems to exist in the same part of the globe as the Solomon Islands. On the hypothesis of transmission, it may have been introduced into those islands by Polynesian castaways who frequently find their way to the Solomon Islands, or more probably may have been brought to these islands by the same people who were responsible for its introduction into Polynesia.

A second consideration to which it is very difficult to know how much weight to attach is the extraordinary similarity of the massage of the Solomon Islanders to the true therapeutical practice. Both when I observed the massage being applied to others and when I experienced its application to my own arm, the manipulations seemed to me to be like those of true massage rather than such as would result from the attempts to catch an animal or some less material agent. When we consider the intense conservatism of people of rude culture, their tendency to perform acts generation after generation in the traditional way, I cannot help feeling that the resemblance of the manipulations to those of true massage may be due to the perpetuation of the practice as it was originally taught, although the ideas underlying the practice have come to be very different from those of the teachers.

The object of this paper is not merely to bring before you a curiosity or to lay down any dogmatic view of its origin, but rather to point out a basic difficulty which confronts those who attempt to trace out the origins of medical beliefs and practices. Medicine is a social institution. It comprises a set of beliefs and practices which only become possible when held and carried out by members of an organized society in which there has come into being a high degree of the division of labour and specialization of social function. Any principles and methods found to be of value in the study of social institutions in general cannot be ignored by the historian of medicine. Here, as in other departments of human

¹ See Turner, *Samoa*, p. 140; Ellis, *Polynesian Researches*, ii. 275; Stair, *Old Samoa*, p. 165.

culture, the outstanding problem of to-day is to determine how far similar practices in different parts of the world have arisen independently and how far they are the outcome of transmission from people to people. The fundamental importance of this problem is only now being adequately recognized by the student of human culture, and I have ventured to use Melanesian massage as a means of calling the attention of members of this Section to a problem which must be faced by all who attempt to study the origins and early history of medicine.

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SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

SOME HISTORICAL QUESTIONS IN THE LIGHT OF
OUR MODERN MEDICAL KNOWLEDGE

BY JAMES J. WALSH, M.D., PH.D., Sc.D.

ONE of the most interesting forms of speculation for a student of the history of medicine is to try and discover under what forms many of the familiar diseases of our day, and especially those that are often fatal, masqueraded in the older time, before differential diagnosis developed sufficiently to enable physicians generally to distinguish them. How keen are such questions as 'Where are the appendicitis cases of the centuries before the latter part of the last?' Some of them are concealed under the vague term colic, some acute indigestion, some inflammation of the bowels, some peritonitis, but undoubtedly many of them came under other heads. 'Where are the causes of death from rupture of tubal pregnancies, and from perforating ulcers of the stomach and other hollow viscera? Where are the fulminant pancreatitis cases and other fulminant diseases? Under what heading were the chronic metabolic diseases, diabetes, and the organic lesions such as cirrhosis of the liver placed?' Then the different forms of anæmia and leukæmia and Hodgkins's disease, whose progressive effects could not have been missed, what were they considered to be? The internal cancers that so often baffle diagnostic skill, what were they called when a physician had to give some explanation for death? Undoubtedly this chapter of history must contain many interesting details, and not only suggestive notions as regards medicine, but also social and historical conditions generally.

The reading of our present knowledge of medicine into past history will undoubtedly change many historical conclusions and solve not a few historical mysteries. Already it has been pointed out that very probably the decadence which came in Greece after Pericles' time was, partly at least, due to the fact that the expedition to Syracuse brought back with it to Athens the severe form of malaria common in the central Mediterranean island, but which had not been noted in Athens before. The mosquitos were already present, so that it was not long before the disease spread widely, with the production of that deterioration of the national spirit which so often comes in malarial countries. It has been pointed out

that very probably the hook-worm existed in the Nile valley, as it does now, for many centuries, and that some at least of the ups and downs of Egyptian history, so difficult to explain otherwise, and especially the fact that foreigners in successive migrations came in and gained control of the country rather easily, were due to that fact. Those of us who have seen the effect of it on American soil, where we did not suspect its existence until a few years ago, would be quite ready to believe it capable of producing such effects. Its victims would easily become the prey of foreign invaders far below them in civilization, who had not as yet had their natural vitality sapped by this parasite.

With these important sidelights on even ancient history from our very modern medical discoveries, it would not be too much to anticipate that a discussion as to where the unexpected deaths in what seemed reasonably healthy persons are to be found in history would reveal a revolutionary change of view as to some historical traditions. There are many traditions, or at least popular scandalous rumours, of death from poisoning that represent the other most interesting contrast to the absence of any hint of many of our known fatal diseases. It seems almost impossible not to think that the two features have something in common, if they are not in a definite direct ratio to each other.

There is probably no old-time historical tradition much more popularly accepted than that which declares that during all the Middle Ages, but especially toward the end of them, and during the Renaissance, when people had become possessed of certain drug secrets, there were a great many secret poisonings. This is, indeed, supposed to have been a favourite means of disposing of enemies. It is presumed that various poison secrets had been discovered by those who were not scientists or physicians, and could be obtained for comparatively trifling sums of money from those familiar with them, and almost any one who wished might with comparative security put out of the way those whose existence was in any way disturbing. Indeed, such events are considered to have been so common as scarcely to attract much attention. People of excellent standing, of high religious pretensions, of deep culture, and whose nobility should have meant something for true gentility of character, are supposed to be indelibly stamped with the stigma of such heartless activities. The evidence may not have been sufficient in their own time to secure their conviction, but in popular history, at least, there is supposed to be no doubt that they actually accomplished their purpose of disposing effectually of those who hampered them seriously in their projects, or whose presence might stand between them and some desired success.

It is curious how little evidence there is for this lamentable state of affairs so confidently asserted by popular tradition. Only our own ignorance of the Middle Ages and our assumption that they were densely ignorant has left us open to accept such assertions without proof. We have known little about the mediæval, and apparently concluded that the only possible reason for this must be that there was very little to know.

It has been the custom to think that the people of the Middle Ages knew very little about medicine, and that therefore it would have been comparatively easy for those who had gathered some information by chance on human beings, or through a few observations on animals with regard to poisonous plants, to use these without fear of detection for any purpose, however nefarious. In recent years, however, the republication of a series of text-books of mediæval medicine and surgery has made us realize that they took their medical science very seriously, and were possessed of a much larger body of information with regard to medicine and surgery than we have had any idea of until these new sources of information became readily available. Take, for example, surgery; the great text-books of the thirteenth and fourteenth centuries describe most of the operations of the present time and their detailed technique. Operations were done on the skull for tumour and abscess, on the thorax for pus and other fluids, on the abdomen for many reasons, and particularly for the radical cure of hernia and for the treatment of wounds of the intestines. It was realized that unless these were sewed up patients would die, and various apparatuses were invented to aid in the securing of intestinal union. They used the trachea of animals as a sort of internal splint over which the severed ends of the intestine might be brought together, and Hugo Von Pfohlspundt suggested the use of a silver tube with flanges for this purpose, anticipating in certain respects the Murphy button and other similar contrivances of our generation.

These extensive operations, requiring much time for their performance, could not have been done without anæsthetics; but we know now that there were several forms of anæsthesia, including one by inhalation. Such extensive operations without antiseptics would also have been quite impossible, so it is scarcely surprising to find that they had obviated this difficulty too; they used strong wine for the dressing of their wounds, and got union by first intention. That Latin expression, indeed, comes from them, and they boasted of having linear cicatrices which could scarcely be perceived, and blamed surgeons who, having cut through unbroken surfaces, yet had suppuration develop in their wounds, for having made some fault in technique.

The generations that accomplished so much in surgery might well be expected to know much of medicine, and as a matter of fact they did. Down at Salerno they insisted on the value of the natural modes of treatment—air, water, diet, exercise—and did away to a great extent with the Arabic polypharmacy which had been leading medicine astray. Down at Montpellier they treated small-pox by hanging red curtains on the walls, and especially over the windows and doors, thus anticipating one of our most recent discoveries. In the matter of drugs they had a much larger body of knowledge than any one would be apt to think who did not know from actual contact with their books how many and how careful observations had been made and recorded. Any one who will take up Flückiger's *Pharmacographia* will find, even in the brief history of drugs

given in that volume, how much more of pharmacal knowledge there was than is usually thought. For instance, aconite is pointed out by *The Physicians of Myddvai* as one of the plants which every physician is to grow. This Welsh manuscript which we now know as *The Physicians of Myddvai* was published originally in the thirteenth century, so that evidently much was known about this poison. Other poisonous substances—opium, belladonna, cannabis, colchicum, hellebore, hyoscyamus—had been widely experimented with, and their effects, therapeutic and toxic, were well understood. Above all it would have been quite impossible, as a rule, to have employed these substances for poisoning without attracting attention, or at least arousing suspicion, and in most cases leading surely to detection. Besides these, the physicians of the Middle Ages knew their mineral poisons very well, and were much more likely to suspect criminal poisoning from these than from the herbal substances.

Indeed, there came to be a tradition that herbal medicines were comparatively harmless, and that tradition has continued down to our own time, so that the makers of proprietary medicines offered for sale to the public announce that their remedies are purely vegetable in origin and have no mineral poisons in them. This is rather amusing in our day, when our alkaloidal extracts of plants are so much more powerful as poisons, as a rule, than any mineral toxic substances that we possess. In the olden time, however, the preparations of the herbal medicines used would have required, in the crude form in which they were available, large quantities to produce serious poisoning. As a rule, they were nauseous to a degree that would have made the taking of a sufficient quantity to produce poisoning impossible without suspicion being awakened in the mind of the recipient.

We know, then, that the people of the later Middle Ages and of the Renaissance knew poisons comparatively much better than has often been thought, and were not likely to be long deceived by the use of any poison with which their observation had made them familiar. Our own ready acceptance of the tradition as to the frequency of mediæval poisoning is largely due to our assumption of the ignorance of the older times with regard to medicine in general, and particularly with regard to drugs. If we only realize, however, that most of our most valuable drugs, those which retain professional favour as stand-bys in the practice of conservative physicians at all times, no matter how the fads and fashions of prescribing may change, are as a rule very old, and were many of them used, and with rather nice attention to their proper indications, during the Middle Ages and the Renaissance, we shall come to have greater respect for the ability of these old-time physicians, who evidently were not to be so readily deceived or kept in the dark when poisons were being used as the assumptions as to their ignorance have led former generations to think.

In a word this subject of the traditions of mediæval poisoning deserves to be discussed from the standpoint of our more recently acquired knowledge, and nothing is clearer than that a number of the diseases so fre-

quently fatal, which have become familiar to us through exact differentiation in the midst of our progress in pathology, masqueraded in that older time under the shadow of cases of poisoning. Appendicitis with its fulminant course in many cases, and its apparent connexion with the digestion of a meal, as so often appears to be the case, would surely seem to many to be due to poisoning. Any opening of the body would show that there had been a rupture of the intestines, or at least a pouring out of intestinal contents into the abdominal cavity, and this would seem to confirm the idea of a poison so violent in action that it had found its way through the intestinal walls. In the same way this would be confirmed by the rapid decomposition that would take place in most of these cases. All of this would hold for all the perforative abdominal conditions.

Many of the blood dyscrasias that have come to be differentiated as definite diseases in our time must often have aroused the suspicion of poisoning by some insidious slow-working toxic material in the old times. The patient grew weaker and weaker, and paler and paler, mucous membranes sharing with the skin in the process, and all the time strength gradually diminished until he was almost incapable of ordinary movement. The disease would yield to no remedies and seemed to be surely due to some cause constantly at work in the system, and which evidently had not been there before. The people who are attacked are often those who have been in very good health in the immediate past, and it often seems possible to date the beginning of the affection rather definitely. If it was greatly to some one's advantage to have such a sufferer disappear, then it would be very easy to think, before our modern studies in the blood gave us the explanation, that some poison had been administered. Indeed, even in our own time the only suggestions as to the ætiology of pernicious anæmia that have attracted any attention are those which have referred the cause of the affection to some toxic agent. Grawitz in Berlin suggested poisonous gases as from insufficient combustion where much ironing is done, and Hunter suggested the toxins that come from bad teeth. These are only developments of the idea that must constantly have occurred in the Middle Ages that such affections were toxic in origin. When an American millionaire died some years ago in the midst of financial operations on a large scale, that it was to the advantage of others to disturb, it was easy to understand how a slow poison theory would surely have been evoked, but for our recent progress in hæmatology.

Besides these reasonably common affections, the abdominal perforative complications, and the serious blood affections, there are a number of rarer diseases that might very well have been attributed to poisonings, and indeed were due to that, but not to poison deliberately administered. Acute trichiniasis may rather easily produce death in intense pain in the course of twenty-four to forty-eight hours. In the older times, when no precautions were taken against the eating of 'measled' pork, it was comparatively easy for such an accident to occur. As a matter of fact, in

at least one case over a century ago, where a whole series of persons were poisoned in this way, it was concluded that the poison must have been administered by political opponents who sat on the opposite side of the table at a municipal banquet, and none of whom suffered any symptoms, though all those on the other side of the table exhibited severe symptoms and a number of them died. I believe that in this case, though subsequent investigations have shown that almost beyond doubt the deaths and the illnesses were due to acute trichiniasis, some of the unfortunate political opponents were actually put to death. Medico-legal experts have always been more ready to swear as to the value of their positive knowledge than subsequent events proved to be justified, and this seems to have been a case of this kind.

It is not unlikely that certain of the syphilitic and parasymphilitic conditions, especially as they affect the nervous system, and above all the mysterious deaths, as they must have seemed in young vigorous persons, due to syphilitic brain affections, may very well have been mistaken for poisonous conditions. Personally I find it difficult to think that syphilis is a modern disease, though first heard of in the late fifteenth and early sixteenth centuries, and I think that very probably it was in existence for many centuries masquerading under various forms. One of these undoubtedly was the so-called secret poisonings. Some of the surgeons of the Middle Ages recognized the chancre as a venereal disease, and it seems difficult to think that they had not observed its connexion with subsequent developments, for they were good observers. Besides, there are records of the use of mercury inunctions from very ancient times apparently, and this would seem to point to the existence of the one disease for which we have found them useful.

One of the arguments adduced for the origin of syphilis at this time, at least in Europe, is that at this period a very large number of cases are heard of, while none were noted before. That argument, however, means very little, for when a disease becomes the subject of such concentrated attention as developed at this time, everybody becomes able to recognize it, and often a number of cases of it are found though none were described before. In America we have just gone through an extremely interesting experience in that regard, for only about five years ago one of our most important text-books of medicine declared that *pellagra* was of no interest to us in America, because we had no cases of it in the country. Shortly afterwards a few cases were found, and then a great many physicians became interested in it, and now altogether many thousands of cases of the disease have been recognized, and its occurrence has been traced back with reasonable probability for nearly a century.

After studying the problem of popular reports of poisonings during the Middle Ages and popular reports of cures of disease in our time, the suggestion lies very near that the two phases of medicine should be taken under consideration together. In our time we have a great many people who pretend to a knowledge of medicine that they do not possess. They

sell remedies for all sorts of diseases to those whom they can persuade to purchase them, and they present a long list of 'cured cases' as evidence for the efficaciousness of their remedies. Quite needless to say, these remedies come and go, enjoy a reputation for a time and then are relegated to innocuous desuetude. Most of them are quite harmless, but some of them, when taken as freely as these people advise, can scarcely but be harmful. In spite of that they are consumed in rather large quantities, and people pay good money for them, and many of them not only are quite satisfied with their results, but become rather ardent advocates of them.

For a long time I have felt quite sure that in a similar way there were a good many people in the later Middle Ages and the Renaissance time who, as our quacks with their 'cures', pretended to be in possession of wonderful secrets of poison and sold them to their less 'knowing' contemporaries. If after the administration of a poison the individual for whom it was intended did not die, there were at least as many excuses as may be made for the failure of a proprietary medicine in our time. All the proprietary medicines are guaranteed to cure, and in many of them the advertisement says money refunded; but whoever hears of money being given back or even sued for, though we all know that in most cases the remedy is quite useless, and as a rule affects only the mind, not the body of the patient.

When it was a question of poison there was still more unlikelihood of any recrimination. On the other hand, if by any chance the individual to whom the poison was given happened to die any time within a few months, or perhaps even a year, after its administration, the poison seller took the credit for it, provided of course there was no danger in so doing, and in many cases he probably blackmailed his customer into giving a good deal more money lest there should be any exposure. If the individual died of any lingering disease, symptoms of which were noted within a year or so of the poison incident, the effect of the poison was considered to be responsible for it. Very probably not a few men thought that they were responsible for deaths—and they were so far as intention went—which occurred from factors that were quite innocent, and merely the result of pathological and ætiological conditions that are now recognized to be the inevitable developments of certain defects in the body, or certain infectious agents from without.

Lest it should seem impossible that a traffic of this kind could be carried on without detection, or at least without punishment, I may be permitted to recall the situation in our own time, now fortunately improving, with regard to abortifacients. Many remedies supposed to produce abortion used to be advertised rather openly, or at least with a very thin disguise. They were called 'female regulators' or 'correctors of delay of menstruation for any cause', or something of that kind. They are still sold under various names that are popularly recognized as remedies likely to produce such consequences. Pennyroyal, for instance, has become associated in the public mind with the idea of abortion, and there are many forms of

pennyroyal pills that are sold in large quantities and that are taken with the hope of some such effect.

Physicians know very well that there is no remedy which will produce abortion without very serious disturbance of the mother's general health. Not only that, but it is well known that some of the remedies which have a reputation for producing abortion may give rise to rather serious poison symptoms, and yet not bring about an emptying of the uterus. There is considerable underhand dealing in these remedies and some of them have gained a certain subterranean reputation. Cotton-root in America, oil of tansy, oil of rue, and other strong drugs, as phosphorus in Europe, enjoy such a reputation. They are sometimes sold by underhand methods at very expensive prices to those who have some reason to be willing even to commit crime to avoid disgrace.

This it seems to me is a strikingly analogous state of affairs to that which existed in the Middle Ages with regard to poisons. There exists the popular tradition now, that physicians have many remedies by which abortion may be easily procured. We physicians know that there are no such drugs. The popular tradition, however, still continues to be prevalent. In the Middle Ages many people believed that there were poisonous drugs of various kinds, which could be given easily and surreptitiously, which would produce death without any possibility of detecting the toxic agent at work. As a matter of fact no such drugs were known at that time, but that made no difference so far as regards the persistence of the tradition. Pretenders to knowledge sold for good round sums perfectly harmless materials, claiming that they were poisons, just as supposed abortifacients have been sold in our time, and in neither case is recrimination possible. Occasionally abortion takes place accidentally—even where it is much desired—and the occurrence of these cases—the statistics show that about one in six pregnancies end by abortion—lead to the persistence of the tradition, as the unexplained deaths in the Middle Ages did for the poisons.

There are a number of historical reports of poisoning, or at least accepted rumours of poisoning, when well-known people died unexpectedly, or at a moment when it was to somebody else's advantage that they should die, the cause of whose death has been traced, as far as is possible from the historical details, to certain definite pathological conditions. It is probable that with a little care many others can be similarly explained. The ease with which a rumour of poison may be spread or may find its way into even what is thought to be serious history is remarkable. All sorts of lingering illnesses have sometimes been attributed to poisoning. The acute illnesses, especially when they take away young folks, are much more liable to such misconstruction. The death of Henrietta, which caused such a stir in the French court, and whose panegyric has made her immortal in literature, was not without hints of poison, though it would seem to have been simply an example of one of these perforations of an ulcer of the stomach so commonly reported in young women.

When Francis II, King of France, Mary Queen of Scots' husband, died in early manhood, Ambroise Paré, the royal attending surgeon, was not free from the imputation of having given him poison, and it was even said, with circumstantial detail, that this poison had been administered through the ear. As one realizes from *Hamlet*, this was supposed to be a frequent avenue for the secret poisoner of old. Any one who reviews the history of the illness of Francis II will surely come to the conclusion, however, that that monarch died of mastoiditis following internal ear disease. Ambroise Paré surely did as much as possible at that time for the cure of it, yet his biographers have had to defend him from the charge of poisoning the monarch.

The liability to such charges has not ceased in our time, and many a physician has been accused or fallen under the suspicion of making a mistake at least in the administration of some remedy, because his patient happened to go into a coma from a rupture of an artery in the brain, or kidney involvement, or diabetes, within a short time after the administration of a remedy. Particularly if a hypodermic injection of morphine is given, there are many people who will never be quite open to conviction, if there should happen to be subsequent symptoms of serious character, that the physician is not in some way responsible for them.

It is clear, then, that the definite clearing up of the question of poisonings during the Middle Ages, and, above all, the eradication of the popular impression as far as that is possible in the matter, would do good even in our own time. The considerations already suggested open up an important field for the application of present-day knowledge to historical problems that will undoubtedly be of great value to history, and enable us to understand how much farther back many affections now familiar may be traced than we have any direct account of at the present time; but at the same time such a solution of these old-time problems, if popularly diffused, will help people to understand the occurrence of cures that are not cures in our time, and the whole question of the lack of scientific evidence for popular medicine.

It will probably be a rather difficult matter to modify popular impressions with regard to the poisonings of the Middle Ages. They have become favourite legends representing mankind's tendency to myth-making at all times. A superstition might well be, as its name seems to indicate from etymology, though it does not, a survival or *superstes* from a previous mode of thinking for which the reasons have disappeared in the advance of our knowledge, and these poison stories might be cited as a typical superstition of popular medical history. When we try to find more particular evidence and specific instances of poisoning, with details that would enable us to recognize, even at this distance of time, from the symptoms described, just what was the mode of poisoning, there is very little to be found. Take the case of the Borgias. They are supposed to have been absolutely pitiless poisoners. Any of their contemporaries who was in the way of their schemes was in danger of meeting a sudden and violent death, presumed from poison, until their names have become a by-word

in history. It is forgotten, however, that the Borgias were a Spanish family, making their way successfully in Italy, and that every Italian's hand was against them, and that many Italians did not hesitate to malign them, and very few Italians refused to believe any story, however apparently incredible, that might be told about them. Contemporary documents come largely from their enemies, and it has been a very difficult problem to determine the truth or falsity of these charges. I once suggested that a most interesting series of lives of the Presidents of the United States might be made from what was said of them by their opponents during political campaigns. It would be an appalling record to posterity, from contemporary documents, of the absolute lack of character of the men who were afterwards Presidents of the United States.

It is largely from such documents, however, that the history of the Borgias has been written. Every advance in modern scientific historical investigation has cleared their name more and more of these charges against them, until, in the 'Cambridge Modern History', Richard Garnett, who knew this period very well, did not hesitate to declare with regard to Alexander VI :

'There remains the charge of secret poisoning for motives of cupidity, which indeed appears established, or nearly so, only in a single instance.'

We have heard of almost unnumbered poisonings by them, and here they are all boiled down to a single case, and even with regard to that the historian hesitates, and does not say that it is absolutely established, but that it *appears nearly established*.

Take the case of Lucretia Borgia. Her name has become a by-word for supposed malice and viciousness almost too deep for human nature. Nearly every charge has been disposed of by Gregorovius. We know that during the last two decades of her life, while she lived at Ferrara as the Duchess d'Este, she was fairly worshipped by her people for her kindness and charity, her thoughtfulness, and for her sanctity. Almost the whole population of the city followed her to her tomb as that of a saint. With regard to her, Richard Garnett has pointed out, in the 'Cambridge Modern History', that the rather unsavoury divorce proceedings by which her separation from Sforza was brought about might all have been avoided by the simple method of secret poisoning, if that had been the custom of the family. Secret poisoning would have been more easily and conveniently employed than the disagreeable and scandalous method of a legal process, if the traditional conduct of the Borgias in this respect were true. If Lucretia Borgia as a secret poisoner is to be condoned and the Borgias generally whitewashed in this respect by historians, what can we believe of the other and merely vague stories that are told of mediæval and Renaissance poisoners ? ¹

¹ There seems to be no doubt that the reason alleged for that divorce, the impotency of Sforza, was the actual occasion for the declaration of nullity of the marriage which was handed down by the papal court. That was the only marriage in which Lucretia had no children, and she had children by both her other husbands.

Just as future historians will have to discount the significance of our wonderful advertised 'cures' and must not be allowed to assume that we were totally degenerate, even though, as he will readily detect, abortifacients under thinly-veiled disguises were commonly advertised in our daily papers, so we shall have to make allowances for the Middle Ages in this matter of poisonings. The sensational stories of necklaces which would eventually produce fatal poisoning, or of bracelets or other jewellery that would bring on slow but sure death, or of an almost invisible powder that might be put on one side of a knife, and the knife used to cut an apple, the portion of which inoculated with the powder would be deadly poisonous, though the other half would be quite innocuous and could be eaten with impunity by the poisoner, thereby affording him the best possible evidence in defence, were legends invented in order to cater to the love of the marvellous that has always existed in mankind. We are told just as marvellous stories by the newspapers of cures of many kinds—and be it said just as absurd—and the public seems to swallow them just as readily as the mediæval peoples. No poisoning case can be accepted on general principle, but each one must bring with it definite evidence as to what the poison really was. This is the only safeguard for history, and undoubtedly most of the poisoning cases of old-time history will disappear before rational medical criticism in our time.

[Thursday Morning, August 7]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

THE INFLUENCE OF PYTHAGORAS ON GREEK MEDICINE

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THE sixth century before the Christian era will always be famous in the world's history for the great names of Buddha in India, Laotzŭ in China, and Pythagoras in Magna Græcia. But the sages of India and China were entirely religious teachers or philosophers, and to this very concentration of aim is due the fact that the religions of Buddhism and Taoism number their adherents by millions at the present day. Far different, however, is the case of Pythagoras, for it would be difficult nowadays to point to any 'Pythagoreans', even our vegetarian friends being inclined to trace their intellectual ancestry from the East rather than from the philosopher of Samos. Like Buddha and Laotzŭ, Pythagoras also was a religious teacher, who indicated a 'Way of Life', and founded a society which enjoined on its followers certain rites and ceremonials. Like other great religious teachers of mankind, with the exception of Mohammed, he has left no writings behind him; it would seem that oral communication, by reason of its greater spontaneity, is the channel best suited for the transmission of great religious conceptions. Personal intercourse and intimacy with a few chosen disciples who disseminate the doctrine is the characteristic note of all the great spiritual leaders of mankind. Inspiring as Pythagoras must undoubtedly have been as a religious teacher, he possessed, unlike the sages of the East, an insatiable intellectual curiosity, which distinguishes him as a true son of Hellas. Hence it is that he was also famous as a man of science who occupied himself with Mathematics, Acoustics, and the Laws of Music. Just as Thales of Miletus had taught that water was the ultimate origin and basis of all things, and as Anaximenes had held that the same was true of Air, so Pythagoras regarded 'Number' as the fundamental groundwork of the Universe. For he felt that ultimate Reality could not be found in Nature with her continual variability, but in something beyond the cognizance of the senses which should be

expressive of the laws regulating the events of the world, and this he found in Number.

It is with this aspect of Pythagoras, namely as a man of science, and his influence on medicine that we are mainly concerned, though, even in this connexion, some consideration of his religious teaching cannot be omitted.

According to one tradition, Pythagoras (born at Samos, 562 B.C.) appears as a sort of glorified 'Medicine man' (*γοητής*), such as Epimenides had been, or Onomakritus, who introduced Orphicism into Attica. In his childhood and youth, we learn that Pythagoras, on account of his exceptional beauty, was the wonder of all the surrounding neighbourhood, and especially on account of his hair he was called *κομήτης*. After travelling extensively in Egypt, and even according to one tradition in India, at the age of 45 he came to settle in Magna Græcia, and took up his abode at Croton. His arrival at Croton created a great sensation, and has been compared to the appearance of Calvin at Geneva. Pythagoras sought out the best of the young nobles of Croton and other neighbouring cities, and taught them to live an ascetic life of temperance. Into the rule of the oligarchy he breathed a new and more ethereal spirit.

The selection of Croton, which was famous for its physicians, as the scene of his teaching is suggestive of Pythagoras having had some special interest in medicine, which he appears to have studied in Egypt. Certain medical ideas may be traced almost directly to the Pythagorean teaching. Thus the well-known doctrine of 'The Critical Days', which plays an important part in the writings of Hippocrates and Galen, seems clearly reminiscent of the importance attached to Numbers by Pythagoras. Celsus, indeed, writing on medicine in the early Roman empire, speaks of the Critical Days as the 'Pythagorici numeri'. According to his doctrine, Numbers possessed not merely complete Reality, but a higher Reality than the concrete objects from which they were derived. Number was a kind of fundamental principle into which the objective world was not merely dissolved by Thought, but from which it proceeded. Numerical existence is the only invariable existence, hence Things are the copies of Numbers.

The great significance assigned to Numbers by Pythagoras is found influencing the medical writings of Empedocles, who was the leader of the Sicilian school of medicine; thus he speaks of the foetus being formed in the womb on the thirty-sixth day and completed on the forty-ninth (*τὸ γοῦν βρέφος δοκεῖ τελειοῦσθαι ἐν ἐπτά ἐβδομάσι*), having probably been led to this speculation by the fact of these numbers being the squares of six and seven respectively. But to the number seven the Pythagoreans attached a special importance; it may be that their medical studies had taught them how that the milk teeth appear in the seventh month, that the second teeth come out in the seventh year, that puberty synchronizes with the fourteenth year, and that the beard begins to appear in the twenty-first year. Certain it is that the number seven

possessed a kind of mystical sanctity for the Pythagoreans; thus the seventh-month child was expected to live, but not the child born at the eighth month. Philolaus, the Pythagorean, identified this number with Health (*Hygieia*), and also compared it with the goddess *Athena*, who was a virgin and without a mother; thus the number seven alone of those up to twelve cannot give rise to another number or be divided by another number except unity (*παρθένος ἀμήτωρ—ἑβδομὰς μόνη τῶν ἐν τὸς δεκάδους οὐ γεινᾶ οὔτε γεινᾶται ὑπ' ἄλλου ἀριθμοῦ πλὴν ὑπὸ μονάδος*).

One of the most distinguished physicians of *Magna Græcia* at this time was *Alcmæon*, who was a young man during the old age of *Pythagoras*, and dedicated a book to him. Doubtless it was from *Pythagoras* that *Alcmæon* derived the doctrine of 'Opposites', according to which the original opposites of the Limited and Unlimited brought forth a series of nine other pairs—the Odd and Even, the One and the Many, the Right and the Left, the Male and the Female, the Straight and the Crooked, the Light and the Dark, the Good and the Evil, the Square and the Oblong. *Alcmæon* observed that most human things were two, i.e. man is made up of the Hot and the Cold, the Moist and the Dry. Disease was the 'Monarchy' of any one of these, while Health was a condition of 'Isonomy', or the establishment in the body of a free government with equal laws. From the same Pythagorean source *Hippocrates* derived his doctrine of the four Humours, and it was the proper mingling of these which constituted Health. Similarly, the Greek idea of the Soul being a Harmony seems to have originated from *Pythagoras* in connexion with medicine; thus *Simmias*, the Pythagorean, expresses himself in *Plato* as follows, 'Our body being, as it were, strung and held together by the warm and the cold, the dry and the moist, and things of that sort, our soul is a sort of temperament and attunement of these, when they are mingled with one another well and in due proportion. If then our soul is an attunement it is clear that when the body has been relaxed or strung up out of measure by diseases and other ills, the soul must necessarily perish at once.'

With regard to the actual medical practice of the Pythagoreans, it would seem that their principles of treatment were characterized by a great simplicity. To diet they attached special importance, and also to gymnastic exercises; they used poultices and salves very little, still less internal medicaments, and, least of all, the knife and cautery. To plants *Pythagoras* attributed magic virtues, and he made use of them in the treatment of disease. He considered that there was a close relation between plants and animals; he spoke of the seeds of plants as eggs, and their fructification as gestation. For the bite of a scorpion he advised wine flavoured with aniseed, and thought that aniseed held in the hand was very efficacious against epilepsy. He also praised 'mustard' as a penetrating remedy and useful for the bites of serpents and scorpions. In the writings of *Epicharmus*, a Pythagorean of the Sicilian school, we find the virtues of the cabbage extolled both as an internal and an external remedy. But the diet of the soul had to be considered no less

than that of the body, since the soul was the harmony of the body. For this purpose the Pythagoreans employed music, to which they attached the greatest importance, and they attempted to cure diseases by incantations, a belief in which is to be found in the writings of Plato ; they were of opinion that music, if it was properly used, contributed greatly to health. Similarly, they employed select sentences of Homer and Hesiod for the amendment of souls.

This harmony of the soul and the body seems to have rested on a very finely adjusted balance, for the Pythagoreans were not permitted to indulge in the most innocent passions, such as effusions of joy, for fear of disturbing the harmony. According to the discipline of the Pythagorean brotherhood, every hour of the day was turned to good account, every duty was exactly determined. All their life was consecrated to keeping the forces of the body and soul in a continual harmony, and in avoiding the least infraction of the rules of the Order, and the least offence against the moral and physical régime which the master had prescribed.

We must now turn to the indirect influence of Pythagoras on medicine, that is to say, the influence of the religious teacher and preacher rather than that of the man of science. Whatever importance we may attach to the truth of his travels in India, where he studied Brahminical institutions, or in Babylon, where he learnt Arithmetic, or in Egypt, where he apprehended Theology and Geometry and is said to have been initiated into sundry mysteries, there is no doubt that in one aspect the teaching of Pythagoras implied the introduction of a new spirit which was not characteristically Hellenic.

The naïve insouciance of the Greek, combined with an astonishing keenness and freshness of intellect, has given to Hellenic literature its abiding and perennial charm. For the first time, and perhaps the last, the fresh mind of the child united with the intellect of a man confronted the profound problems of the Universe. Undistracted by the multitudinous mass of details which obstruct the vision of the modern philosopher, they were at least able to see life steadily, even if they did not see it whole. But beneath this surface clearness, freshness, and insouciance, there flowed an undercurrent of darker and more sombre thought, which we connect with Orphicism or the worship of Dionysos and the various mystic cults which existed in Greece, though in the time of classical Greece they formed but a subordinate feature of its life. Much of the attractive grace of Greek life and literature is due to the fact that important aspects of thought and feeling were omitted from it. Consequently, it was able to present a harmonious front to the world, being in fact at unity with itself, and it is this unity in its life which has exercised so powerful a spell over all future generations of mankind. The sense of disunion ; the separation between the soul and the body ; the sense of ' Sundering ', ' Sünde ', sin ; the questioning about a future life, and the consequent comparative disregard of this one—all these

are ideas more commonly associated with the modern world, and often thought to take their origin from Christianity. It is a mistake, however, to suppose that Christianity was in any sense responsible for these ideas, because they had their beginnings at a date long anterior to Christianity in other religions of the East. Christianity came to bring healing and a message to the sin-sick soul, but Christianity did not introduce the sense of sin into the world. Whether these ideas were of purely Eastern origin, it is difficult to say, but certainly they are to be found in the Orphic mysteries which came from Thrace, and Pythagoreanism, though by no means the same as Orphicism, belongs to the same intellectual family.

Differing as the Orphics and Pythagoreans did in many respects, yet they had this in common, namely, 'The Fall of the Soul by Sin'. The Soul was of divine origin, and its earthly existence unworthy of it; the body was a fetter, a prison, a grave, only through atonement and purification could the soul return to the divine home whence it came; this was to be accomplished by the penalties of Hades and by the cycle of births. Both Orphics and Pythagoreans believed in the glaring contrast between earthly suffering and earthly imperfection on the one hand, and heavenly bliss and heavenly purity on the other. A single earthly existence was not enough to cleanse the soul from its original sin and to redeem it from defilement. All mystics endeavour by direct intercourse and gradual assimilation to obtain a final identification with God. The Pythagoreans identified Unity—the Principle of Good—with the Godhead, while Duality—the principle of Evil—was identified with the material world. The word 'Philosopher' is said to have been invented first by Pythagoras; there is a story that when in the Peloponnesus he made the following answer to Leontius: 'I have no Art, I am a Philosopher.' What does that mean? 'This life may be compared to the Olympic games, for, as in this assembly some seek glory and the crowns, some by the purchase or by the sale of merchandise seek gain, and others more noble than either go there neither for gain nor for applause, but solely to enjoy this wonderful spectacle and to see and know all that passes,—we, in the same manner, quit our country, which is Heaven, and come into the World, which is an assembly where many work for profit, many for gain, and where there are but few who, despising avarice and vanity, study nature. It is these last whom I call Philosophers; for as there is nothing more noble than to be a spectator without any personal interest, so in this life the contemplation and knowledge of nature are infinitely more honourable than any other application.'

Pythagoras was one of those rarely gifted men who combine the objective realism of the man of science with the religious fervour of the mystic. A similar instance may be seen in the case of Pascal, but here the scientific and mystical aspects of his nature were less happily blended, being marred by an essential morbidity of soul.

To the disciples of Pythagoras science meant a purification, a means

of escape from the wheel of life ; for the greatest purification is disinterested science, and it is the man who devotes himself to that—the true philosopher—who has most effectually released himself from the cycle of births ; in fact, the Pythagoreans at Thebes came eventually to use the word ‘ philosopher ’ in the special sense of a man who was seeking to find a way of release from the burden of this life. More precisely it may be said that the primary object of the Pythagorean Order was to secure for its own members a more adequate satisfaction of the religious instinct than that supplied by the state religion.

That there were distinct elements of Asceticism about the system of Pythagoras admits of no reasonable doubt, but, unlike the Eastern anchorites and monks of the Middle Ages, Pythagoras did not despise the body, but believed in the excellence of bodily vigour. His intellectual curiosity, however, did not lead him to study disease in great detail, for disease was the exception, which perhaps did not want much study ; he was more interested in health as such, how it could be maintained, how in the words of a modern writer the body could become the quiet handmaid of the soul, or in Christian phraseology, ‘ The Temple of the Holy Ghost ’.

Mystical speculations and intuitions can never in the realm of science bear the same positive fruit as the patient investigation of material phenomena ; at the same time, such speculations serve to fertilize science, and, by bringing it into contact with the whole, prevent that too great isolation from life which is the danger to which science is specially liable. It is perhaps not the primary business of the physician to have a reasoned theory of life, and yet his activities must bear some relation to the thought of his age. The effect of the teaching of Pythagoras was to keep medicine in close connexion with the philosophic thought of the time. What claims our special interest is the combination of a mystical vein and ascetic practice with considerable scientific curiosity and attainments united with a belief in the excellence of bodily vigour. In a later age these two aspects of Pythagoreanism became disjoined and the Neo-Pythagoreanism appeared as a disfigured and distorted doctrine, as did also Neo-Platonism. Both resulted in a pure mysticism, with the consequent abandonment of all attempt to put the world upon a rational basis. Such an influence must always be inimical to medicine, the art of which consists in alleviating human pain and suffering by a rational comprehension of the nature of things. Neo-Pythagoreanism substituted fanciful speculation for a rational investigation into phenomena, without which medicine is incapable of progressing. Many echoes of Pythagorean doctrine may be found in Plato, and specially in the dialogue of the *Timæus*, which is put into the mouth of a Pythagorean ; thus he says, ‘ He who instead of accepting his destiny endeavours to prolong his life by medicine is likely to multiply and magnify his diseases. Regimen and not medicine is the true cure when a man has time at his disposal.’

In the time of Cicero, the Pythagorean philosophy was revived with but little or none of its scientific tendencies and with more than its primitive religious and imaginative fanaticism. The first adherent of this Neo-Pythagorean school was a friend of Cicero, namely, P. Nigidius Figulus. This school borrowed both from the Peripatetics and Stoics. They certainly practised a severe asceticism, abstaining from flesh and wine and marriage ; all oaths and animal offerings were forbidden, and they also practised community of goods. The Essenes, an ascetic sect of the Jews, to which John the Baptist belonged, appear to have been subject to Neo-Pythagorean influences.

Apollonius of Tyana, in the reign of the Emperor Titus, gave himself out as a second Pythagoras, and traversed the Roman world with the reputation of a wizard. The element of charlatanism which so readily clings to any system of belief which is prepared to dethrone reason, grew to a luxuriant rankness in the character of Apollonius. He appears, indeed, himself to have been sincere ; certainly he practised the severe asceticism of the Pythagorean sect, wore pure linen, abstained from wine and flesh, observing the five years of silence, and making the temple his home. He felt a special attraction for the worship of Asclepius, which was then gaining an extraordinary vogue with its atmosphere of serenity and ritual purity and its dream oracles of beneficent healing. Apollonius, doubtless, scorned the popular conception of divination and magic, but believed that by crucifying the flesh and attenuating its powers, the spirit might lay itself open to heavenly influences. He considered that any sensible image of the Supreme which does not carry the Soul beyond the bounds of sense, defeats its purpose and is degrading to pure religion ; pictured or sculptured forms are only aids to that mystic imagination, through which alone we can see God. Next to the knowledge of God, he preached the importance of self-knowledge and of lending an attentive ear to the voice of conscience.

There can be little doubt that the New Pythagoreanism, as represented by Apollonius of Tyana, was an essentially religious philosophy ; its adherents reproduced the spirit of their founder in mathematical symbolism and in the ideal of asceticism, but the scientific insight which was so characteristic of the sage of Samos had entirely disappeared. Emphasis was rather laid upon an assumed faith in immortality, the conception of this life as only preparatory and secondary to a future life, the need of purgation and expiation for deeds done in the body, the doctrine of transmigration and successive lives, possibly in animal forms. Such a conception of life is seldom favourable to medicine or to science generally ; for if this life be a burden and the body but a prison which shuts out the light of heaven from the immortal soul, then neither for the philosopher or the saint can any worthy end be attained by such a life being preserved or prolonged.

Consequently, many of the best minds of the early Empire were drawn away into mystical speculations and religious self-absorption, so

that little progress could be made with science, and when Galen appeared with his highly elaborated and philosophized system of medicine, which provided an answer for every question and a solution for every doubt, his teaching fell upon willing ears, and men were only too glad to have a decent excuse for giving up the toil of thinking. Of this they availed themselves in the realm of medicine for nearly 1,500 years.

Science and mysticism do not easily harmonize together. Occasionally a rare personality like Pythagoras exhibits this unusual combination, and may in his lifetime promote equal enthusiasm in either direction; but usually it survives for only a short time, and, as we see in the case of Pythagoras, after-generations were only attracted by the religious and mystical side of his teaching, which eventually sank into every form of intellectual obscurantism.

[Thursday Afternoon, August 7]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

FIGURATIVE ARTS IN CONNEXION WITH THE
HISTORY OF MEDICINE

BY PROFESSOR ANDREA CORSINI

It is certainly not the purpose of the present paper to develop, even slightly, so vast and important a theme as that announced by the title, which would require a good deal of time, nor do I intend to reveal any new fact. I only wish to direct once more the attention of all my colleagues to the importance of figurative arts in the particular branch of history forming the object of our Congress, and to induce you to observe with the greatest attention any picture, fresco, sign, statue, or figurative object whatever falling under your eyes, and having connexion with our new studies.

I am certainly not the first who paid attention to the connexion existing between art and medicine; I have only to remember the great name of Charcot, who seems to have been inspired by a picture of Rubens observed by him in the church of St. Ambrogio in Genoa, which induced him to write that work *Daemoniacs in Art*, which was a splendid predecessor to his following researches on *The Sick and the Deformed in Art*, and to his *New Iconography of the Salpêtrière*, conducted to an end under the direction of his scholars Gilles de la Tourette, Albert Londe, and of that Paul Richer whose beautiful work *L'Art et la Médecine* is of a later date.

I would even go a step farther and recall to mind what Anile¹ so justly remarked, 'that there will hardly be history of a branch of science, the origin of which should not be discovered in the History of Art'. I do not think the artist would have been able to reproduce nature without invading the field of Science, which is nothing else but nature itself studied in its singular parts. We need not insist any longer, for instance, upon the fact of Anatomy forced to enter a strict connexion with Art, in order to remain in the field of Medical Science. It would not have been possible, indeed, to give a figurative reproduction of man or animals without observing, even superficially, their forms. In the rudimentary

¹ Anile, A., *L'Anatomia dell'uomo nella storia dell'arte* (Anatomy of Man in the History of Art), Naples, 1912.

state of Art, two circles and four lines were certainly enough to reproduce a man, his head, his body, two arms and two legs. But that was the first study of anatomy, which then completed and perfected itself with the progress of time, until it reached the most developed forms we admire in the drawings of Leonardo da Vinci, Michelangelo, and other of the greatest artists.

But it is neither my task nor my wish to speak abstractly of relations interfering between art and science in general, and art and medicine in particular. I would rather state how figurative art, besides being always an unrivalled and indispensable material for teaching and sometimes for objective clinical researches, as, for instance, for Charcot, can also be a guide furnishing precious elements to students of history of medicine. The fact is that monuments and inscriptions have been studied, and Greek and Latin authors read and commented upon, but figurative art has not yet been duly considered as it really merits. That good fruit may be plucked here is shown by some recent studies, as Professor Albertotti's on eyeglasses,¹ and Professor Carbonelli's on pharmacies,² Dr. Crawford's on plague banners,³ &c., and I myself, who have for some time been making researches of that kind, have had an excellent and decisive confirmation of what I am saying.

A careful study, essentially based upon observation of Florentine pictures of the Renaissance, by which, after publishing even a short paper, I have produced new artistic elements fitted to confirm my assertions, had indeed induced me to state that Florentine physicians of the said epoch used to wear a red dress. Now, a short time ago I found in a very interesting book, viz. the *Discorsi di Monsignore Vincenzio Borghini*, a phrase—which I had not mentioned at first, my former researches having been only on paintings and documents of that period—that really definitely solves the question. Borghini⁴ says as follows: 'Not many years ago the College of Physicians of our town (abandoning the custom of some magistrates that still persists) put off the red clothes, which, besides giving an immediate representation of the profession, offers a fine, gay sight; if dress were a means of curing people, the change would have had bad consequences. I know well that for a long time some of them were fiercely criticized by those who were used to that custom, and had wished to conserve it; nevertheless it does not follow from it that all that which has been used in later times about this custom, or others, should have been in use also in former times.' As you see, this text clearly confirms what pictures have shown us, and ancient MSS. could only induce us to suppose, that is to say, as I wrote

¹ Albertotti, G., *Noticelle intorno agli occhiali (Occhiali dipinti)*, Padova, 1913.

² Carbonelli, G., *Farmacie e Farmacisti in Italia nel Secolo XVI*. Roma Centenari, 1912.

³ Crawford, R., *Plague Banners*, Proceedings of the Royal Society of Medicine, 1913, vol. vi (Section of the History of Medicine).

⁴ *I Discorsi di Monsignore Vincenzio Borghini*, vol. ii, p. 13. Firenze, Viviani, MDCCCLV.

then, ' that the red colour of medical custom should be, at least in the Renaissance period, a kind of characteristic of the Florentine physician.'¹

The study of pictures had not deceived me !

Of all figurative arts, the arts of design (pictures and drawings) are those that best reproduce, even better than plastics, medical subjects, requiring more than in anything else a grouping of several persons, a ground for the scenic reproduction of furniture, rooms, &c., all things for which a painting is needed, and which become even more interesting if represented in colours. Now, statues or reliefs are not fitted for that, and that is why from plastics, portraits excepted, the historian of medicine cannot gain as much as from pictures and drawings.

But not even painting, which no doubt is the most explored of all graphic arts, appears to be so rich in results as it would seem at first sight. Pictures of medical subjects of the Italian school are really not very common, and also those of foreign schools are not excessively abounding. The Dutch school has perhaps furnished the greatest number, and is particularly rich in anatomical subjects. The Rijks Museum of Amsterdam especially contains a room full of such pictures.

What is the reason of this ?

If we only consider how little has remained of antique graphic art in general, we perfectly understand why nothing or scarcely anything has been transmitted to us with regard to medical subjects ; and we can understand it still better, if we consider that, before the Christian era, the human mind was rather seldom disposed to representation of subjects of pain.

Christianity, on the contrary, that found its greatest inspiration in pain, and considered it as the way to celestial bliss in eternal life, exalted the assistance of the sick, who became a kind of sacred being, worthy of comfort and help, in opposition to the ancient who considered sickness as a subject of inferiority, and, in consequence, unworthy of mention. And so it happens that with the beginning of Christianity scenes of sickness and assistance to sick and pilgrims are often reproduced together with saints, and these scenes offer a good material to our study.

Humanism, carrying the human mind back to paganism, was not very fond of such reproductions, and preferred the splendours of landscape, mythological figures, and exaltation of female beauty or male force, all feelings that the painter would transmit unconsciously, also, in purely religious subjects. So, in art, medicine was directly transported from Christianity and sacred representation to *genre* painting, which, as being of later origin, was, as to medicine, almost the heir of religious art. This explains the fact that in Holland, in the Flemish school where *genre* painting may be said to have grown and flourished in the low Middle Ages, a greater abundance of pictures of medical subjects was

¹ Corsini, A., *Il costume del medico nelle pitture fiorentine del Rinascimento*, Firenze, Istituto Micrografico Italiano, edit., 1912.

to be had. In Italy, on the contrary, we do not possess a great deal of such paintings of past centuries, and religious subjects prevail.

But not even *genre* art itself, that reached a higher degree of development in Italy only in more recent times, is giving a great choice of medical subjects ; and it is not difficult to understand the reason of it. Few artists, indeed, profess their art for exclusively artistic purposes ; most work for gain ; and it is difficult to sell scenes of horror and sadness ; and if this will sometimes be realized, it is because the artist has sometimes occasion to reproduce the scene of death of some personage or scenes of an historical character.

The fact of the importance of figurative arts for the history of medicine having so long remained hidden from our eyes, is perhaps owing to this rarity of purely medical subjects. Indeed, if paintings representing such themes had been numerous, they would certainly have attracted our attention and given place to an entire series of observations and researches. There is a fact, however, which even nowadays, when such an importance is duly acknowledged, has not been sufficiently appreciated : the fact, I mean, that for a subject to be interesting for the history of medicine, it is not necessary at all that this subject should be a medical one. My above-mentioned paper on medical costume, for instance, found material for study only in the reproduction of two saints, the holy Cosimo and Damiano, who are, however, often represented alone, without any sick people about them, and also amidst other saints. To religious banners Dr. Crawford first paid attention ; frescoes of every kind were studied by Professor Albertotti, and so forth. Who knows, for instance, whether, observing the birth of Christ, it should not be possible to find, in some unheeded particular, an element interesting for the history of obstetrics ? While admiring in the Gallery of Modern Art in Rome a well-known painting of Eleuterio Pagliano representing the death of Luciano Manara, a painting that offers nothing for a physician, I observed a bottle of corrosive sublimate reproduced in it, with a strip of paper on it, on which was written : ' For inbalsamation.' This bottle represented a method of conserving cadavers which has an historical importance, though for us such a bottle and strip of paper may represent a slight anachronism with regard to the year in which this brave soldier died.

It is not necessary, therefore, in order to make researches, to find a picture with a purely medical subject, but we ought to observe and study attentively any picture that may fall under our eyes, in order to see whether there is nothing that may be interesting for our studies.

But other kinds of graphic art, beyond picture and fresco, may give us a greater choice of facts. I mean the miniatures illustrating our codices, xylographs, engravings, filigranes, &c., which are to be found everywhere on the front sheets of our old books or in them. These are certainly the most neglected monuments of the history of medicine, as, being hidden in archives and public as well as private libraries, they are

less accessible and also more difficult to be discovered among the numerous volumes needing long researches and more extensive studies. The attention of students of the history of medicine ought therefore to be turned especially to this wide, nearly unexplored field of investigation, which only few students, and to a very little extent, have paid attention to.

If it were possible, by methodical research, to gather data about all this material, to make as many reproductions as we can, and, with regard to determinated periods of time, to register, catalogue, and publish everything, I am sure we could at length obtain a *Corpus Iconographiarum* of great interest in itself and highly useful for the comparative studies to which it could give place. I know that some scholars (as the eminent Professor Sudhoff) and the new Museum of History of Medicine, lately opened in London through Mr. Wellcome's noble initiative, already possess some collections of this kind. But who, living far from it, can know them, if an extensive publication is not cared for? Therefore, as an illustrious man of good will, whom I am glad to mention here as deserving great honour, has assumed the noble initiative of publishing a *Corpus inscriptionum ad medicinam biologiamque spectantium*, I should like other students to make a collection of iconographical data, inviting all the students to send notices about what they know, pertaining to medicine in graphic art.

If the simple contemplation of a painting by the illustrious Charcot could give occasion to the production of the above-mentioned works, followed, especially in France, by new researches and smaller publications of an undoubted importance for our studies, I should be happy if my poor words could induce somebody better able than I to initiate this *Corpus Iconographiarum*, that would be conducted within certain limits of time and place, and with rules suggested by more exact and mature principles.

That is all I have to say. I did not bring you, hon. colleagues, the important studies others presented or will present you; I only wished to turn your attention to a special theme. It does not require a particular illustration, but only the attention and sympathy of anybody feeling in his mind the inclination, and in his heart the love—so natural in everybody—towards the memories of the past, towards historical events in general, and the History of Medicine and Science in particular. And for this special love, that I certainly do not feel less than others, you will pardon me if I have detained you too long with my speech.

[Thursday Afternoon, August 7]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

GIRDLES, THEIR USE IN OBSTETRIC PRACTICE

By WALTER J. DILLING, M.B., CH.B., LECTURER IN PHARMACOLOGY,
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IN the history of Obstetrics, the use of the girdle—considered apart from the modern binder—can be traced from remote times, and it is still in use amongst primitive people as an aid in child-birth. The reason and origin of these practices are somewhat difficult to seek and I shall be glad if any of my audience can bring further light to bear on this investigation.

It may be taken for granted that the girdle was one of the earliest articles of apparel; it was also used in remote times as an important adjunct of religious ceremonials; further, we find girdles employed throughout all ages and peoples as amulets for the cure of various diseases, these last being largely definite cases of sympathetic magic, since such girdles are nearly always connected with the name of some goddess or saint.

Attempts to trace any relationship between the religious or amulet girdles and the obstetric girdles have not in my hands proved very successful, but if recourse is made to classical writings, distinct evidence is obtainable showing that the girdle in its relationship to women had a distinct mystical signification. It was, in fact, emblematic of the *Hymen virginis*. The Cestus of Venus in the *Iliad* was apparently emblematic of this, since it embodied the enchantments of the goddess and renewed in Hera her powers of fascination. Ovid also uses the term 'unfastening the girdle' to signify the loss of virginity. These facts must have been known to Shakespeare, for we find in *Henry the Fifth* the expression 'they are all girdled with maiden walls that war hath never entered'. The girdle took also an important part in the marriage ritual in olden times, and it is still considered an essential by nations who preserve their national dress and customs. At a Roman wedding the bride's garments were fastened with a girdle made of sheep's wool and tied with a herculean knot, which was unloosed by the husband on the marriage bed. The girdle was dedicated to Juno, whence was derived her epithet of Juno

Cinxia. This custom is mentioned first, I think, by Varro, who lived about 100 B.C., and it is also described by Catullus, Festus, Macrobius, and Arnobius. Festus states that the girdle was employed to signify the union of husband and wife, and that its loosening was for an omen of fruitfulness; Macrobius remarks, however, that the knot was symbolical of the Caduceus and therefore of the union of Jupiter with his mother Rhea. The loosening of the zona here is again symbolical of the loss of virginity, and although we have no exactly comparable example of this symbolism at the present day, so far as I am aware, the idea was nevertheless preserved in the mediæval custom of scrambling for the bride's garters which originally took place after the bride had gone to bed. I need hardly remind you that this custom was recently revived at the wedding festivities of the German Crown Princess. We find mention of the girdle cropping up in the marriage ceremonies of the Greeks, Macedonians, Russians, Japanese, and even amongst the natives of New Guinea.

Regarding the girdles used in pregnancy and confinement the following philological facts are sufficient to indicate how close the connexion has been between the girdle and the pregnant woman. The Latin word *incincta* means 'girdled', sometimes 'ungirdled', and in the vulgar tongue 'a pregnant woman'; from this is derived the Italian *incincta*, 'pregnant'; Spanish *encincta*, 'pregnant'; French *enceinte*, 'pregnant'; and perhaps also German *entbinden*, having the sense to 'unloosen' and to 'deliver'.

The ensuing short notes afford some examples of the use of the girdle. In ancient Greece the Eileithyia presided over the births of children, and Theocritus speaks of the Eileithyia as the 'girdle-loosing'. Soranus of Ephesus, second century A.D., recommended the use of a girdle till the eighth month, when it was to be removed in order that the weight of the child might assist delivery. In Roman times Lucina, another epithet for Juno or Hera, presided over births, and she acquired the further name of 'Solvizona'—'the girdle loosing'. Pliny mentions an interesting example of its use: 'Delivery when near at hand will be accelerated, if the man by whom the woman has conceived unties his girdle, and after tying it round her, unties it, adding at the same time this formula, "I have tied it and I will untie it", and then take his departure.'

The Jews in Palestine and Brandenburg women used to bind a snake-skin round the abdomen, and Turkish women constricted the abdomen with a band from the fifth month onwards to prevent the child growing too large. Burmese women, again, wear a tight bandage after the seventh month to prevent the uterus ascending too far and the child having a greater distance to travel. In China and Japan similar customs prevail, and the Kalmuck women buckle broad leather belts round their abdomen, and use pressure from above downwards, a practice which is common amongst the American Indians, and explained by the statement that it supports the foothold of the child in its progress into the world. A

rather different custom exists among the Sioux tribes of America ; there the girdle is applied after delivery and worn for a day or longer.

The native tribes of Central Australia also believe in the efficacy of the girdle. Thus if a man ties his hair-girdle round a certain stone his wife will conceive, and if a confinement is delayed the husband's hair-girdle is tied round the woman's body.

African tribes provide only a few instances of the girdle custom. The Zulus fasten a grass rope tightly round the middle of the woman, the Bantus use a girdle as an amulet for easy delivery, while the Shangaan women employ a most curious girdle during pregnancy, but its mode of application is difficult to guess.

In Europe in historic times the use of the girdle has been confined mainly to Catholic communities. A well-known instance is the employment of a cord as long as the picture of St. Sixtus, and in England we read amongst the Privy Purse expenses of Elizabeth of York, in 1502, the entry : ' To a monke that brought our Lady gyrdelle to the Quene in reward—VI^s. VIII^d. ' This is said by a commentator to have been one of the numerous relics with which the monasteries then abounded, and which might have been brought to her to put on when in labour, as it was a common practice for women in this situation to wear blessed girdles. In the ' Battle of Lora ' by ' Ossian ', sanctified girdles were said to have been bound about women in labour to alleviate their pains and accelerate the birth. According to Macpherson the custom came from the Druids, but it is more than likely that they were belts sanctified by Irish saints. Scott, in his *Demonology and Witchcraft*, speaking of Bessie Dunlop's trial for witchcraft, mentions that ' she lost a lace which Thome Reid (a spectre) gave her, which tied round women in child-birth had the power of helping their delivery '. A modern survival of the custom exists in Brittany, where the nuns of a certain convent present their pupils on their marriage with a silken sash inscribed with the words ' Notre-Dame de Délivrance, protégez-nous '. The sash, before being sent off, is touched with a portion of a girdle of the Virgin, which is preserved in the church. Lastly, I witnessed in Dublin, in 1906, the use of one of these girdles in a Catholic house. At the confinement I had decided that the birth would be unlikely to occur before about one and a half hours. A neighbour arrived shortly afterwards with a leather belt, old and greasy, about $1\frac{1}{2}$ inches broad, and long enough to go round the body ; it possessed an iron buckle of ordinary design, and had no special marks on it. It was applied loosely round the chest without special ceremony, and undoubtedly, in my opinion, produced a definite psychological effect, the birth occurring half an hour after its application. This belt was one worn by people who are members of the Society of St. Augustine.

The question which forces itself on one's mind is that of the origin of these girdles. Of the seventy instances I have succeeded in collecting, I find that the majority can be divided into two sections : (1) those

applied during pregnancy and removed when labour begins, and (2) those applied only at the commencement of labour. The first class might be explained on the supposition that they afforded support to the abdomen, and the loosening at labour conforms with the general folk-lore belief that everything, even to the opening of doors, must be loosened at a confinement. The second class is difficult to explain. One may suppose that the application of the girdle was a natural method of applying 'vis a tergo', and one or two cases have explanations of this sort attached to them, but in many of the others the application is so loose and combined with ritualistic customs that one is led to think that they were instances of sympathetic magic.

A more complete account of the history of girdles in relation to religion, medicine, marriage, and midwifery may be found in the author's article in the *Caledonian Medical Journal*, vol. ix, nos. 8 and 9, pp. 337 and 403, where full references are given to the literature on the subject.

[Thursday Afternoon, August 7]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

SOME UNPUBLISHED WATER-COLOUR SKETCHES OF
SIR CHARLES BELL, WITH OBSERVATIONS ON
HIS ARTISTIC QUALITIES¹

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I BRING these unpublished sketches of Sir Charles Bell before the profession, first, with the hope that it may induce others better situated than myself to publish other sketches of his, both drawings and paintings, stowed away in England in museums and out of the way places, perhaps, whose publication at this time, when photography is so universal and the

¹ Through the kindness of Dr. Fielding H. Garrison, Assistant Librarian of the Surgeon-General's office at Washington, D.C., my attention was first called to these water-colour sketches of Sir Charles Bell, and to him I am indebted for their history and for their photographic reproduction. I regret that a rule of the library prohibits their being taken out, for however perfect the reproduction by photography, the colours of the original and an undefined something which these colours and the original itself carry to the eye are lost. However, I believe the photograph is all-sufficient for our purpose, and by showing on the same lantern-slide the original sketch and the etching from which it was made, we get an insight into his methods of work, and further, can compare the differences where the etcher was not the original artist.

These sketches were bequeathed by the late Dr. Thomas Windsor of Manchester (see *British Medical Journal*, London, June 11, 1910) to the Library of the Surgeon-General's office, and he was undoubtedly influenced to make this bequest through his friendship for the late Dr. John S. Billings, at one time its Librarian.

These twelve plates are most of them 10½ by 8 inches in size, in water-colour, showing the high colouring and free brush-work of a preliminary sketch, striking specimens of freehand drawing direct from the dissection. They were drawn undoubtedly before or about the year 1800, when Sir Charles was still in Edinburgh working with his elder brother John, for with the accompanying explanatory script of the plates they form the 'copy' for the first edition of his *Engravings of the Arteries*, published in 1801.

Changes and additions were made in subsequent editions, especially in the third, which bears the date 1811, when the negro's head and the two plates designated as drawn by C. Cheney were introduced. As frequently happens, the pupil, drawing under the eye of the master, copies him, while the master's own touches make the picture more the master's than the pupil's. Sir Charles, to compliment a favourite pupil, designates him as the artist. So I interpret it.

freehand of the true artist so rare, should stimulate us to more artistic work in anatomy and medicine generally; and, secondly, because I believe a study of Sir Charles's artistic work will attract us to the relationship of Art to Medicine, give an added impulse to the study of artistic anatomy, and show wherein we may improve our methods in the mere study of anatomy itself.

To call these sketches, which I have the honour and the pleasure to present to you, 'unpublished' demands some qualification. They have never been reproduced as such, but they were provisional sketches to serve as 'copy' for his etchings in his work on the arteries, the first edition of which appeared in 1801. But the very fact that they did serve as provisional sketches makes them in my mind of greater value, for they show Sir Charles's methods of work, and exemplify certain principles in anatomical delineation well worthy of our consideration.

In a letter to his brother George, written on January 8, 1805, he wrote :

'I am doing my sketches in water-colours complete, out and out, leaving it for after-determination how they may be engraved.' The majority of the sketches were done about or before 1800 and these words apply equally well to them. With the instinct of the true artist he must try out by sketch before attempting the finished picture; and comparing the two before us, we see how he worked and wherein the finished picture excelled or missed the excellence of the first sketch. Sir Charles has himself well contrasted the sketch with the finished picture in his *Anatomy of Expression*, when treating of the uses of anatomy to the painter. He writes :

It is true that the sketch is too often a mere indication of the painter's design, intended to be worked up to the truth of representation as he transfers it to the canvas—that the outlines of the figures are rather shadowy forms, undefined in their minute parts, than studies of anatomical expression, or as guides in the subsequent labour. And, perhaps, it is for this reason that there have been many painters, whose sketches all admire, but whose finished paintings fall short of public expectation. But a sketch that is without vigour, and in which the anatomy has not been defined, is a bad foundation for a good picture; and even a little exaggeration in this respect is not only agreeable, but highly useful. The anatomy should be strongly marked in the original design; and from the dead colouring to the finishing, its harshness and ruggedness should be gradually softened into the modesty of nature. The character of the sketch is spirit and life; the finished painting must combine smoothness and accuracy. That which was a harsh outline in the sketch or the strong marking of a swelling muscle, or the crossing of a vein, will be indicated in the finished composition, perhaps, only by a tinge of colour. The anatomy of the finished picture will always be most successful, and even most delicate, when the painter has a clear conception of the course and swelling of each muscle and vein which enters into the delineation of the action.¹

¹ *The Anatomy and Philosophy of Expression as connected with the Fine Arts*, by Sir Charles Bell, K.H., 6th edition, London, 1872, p. 227.

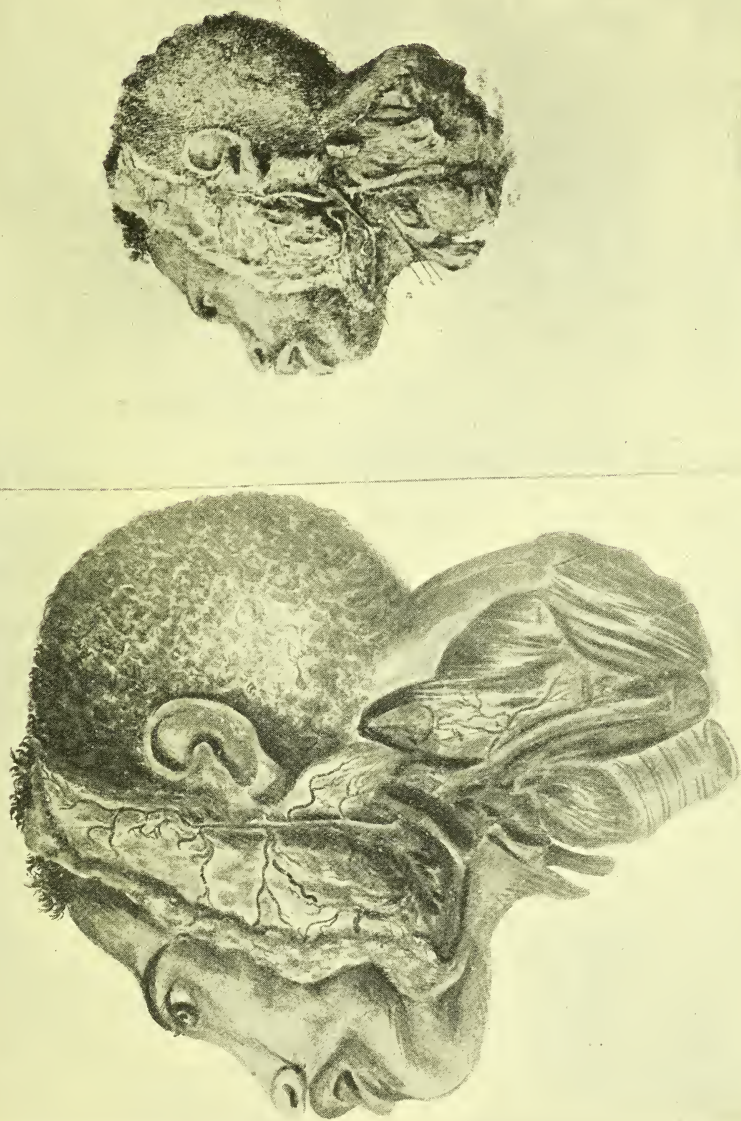


PLATE 4. Drawing and etching of a negro's head showing the carotid artery and its branches. The drawing shows the free brush-work, while the etching shows the more careful working up of the details and the better drawing of the artery.

Of these twelve water-colours the plates marked 2 and 9 are supposedly by Charles Cheney ; Plate 2, the plan of the aortic system, might well be left to a favourite pupil or assistant. Figure 2 on Plate 9, representing a hand with the index finger resting on a book, which figures in the third edition of the engravings, is designated as drawn by C. Cheney and etched by Charles Bell. The etching is somewhat larger than the sketch, and a decided improvement over it. Like Figure 3 in Plate 8 it is a much later sketch, and done on a free space on the paper used years before.

Plates 11 and 12, which appeared in the first and second editions, were replaced by four much better illustrations in the third edition.

Plate 8, which consists of three figures, appears in the third edition as a plate of one figure. In the first and second editions Figures 1 and 2 appear without Figure 3, while in the third edition both Figures 1 and 2 are withdrawn, and the dissected arm, of which Figure 3 forms the proximal end, is alone given. I should therefore say that probably Figure 3 was painted much later than the other figures and that the etching was made direct from the dissection. In other words, Figures 1 and 2 were drawn from dissections done in the early Edinburgh days, while Figure 3 is later London work, and that he considered the dissection better adapted for his etching. It all shows his careful selection.

In Plate 5, Figure 2 is reproduced, while Figure 1, which appears in the first and second editions, is replaced by another drawing to show the arteries of the face.

With these changes, the drawings have been reproduced by engraving or etching, and done by himself, with the exception of Plates 2, 3, and 10, which were etched by J. Stewart.

The accompanying script, which is his own handwriting in my judgement, is the script of a copy-book, written with great care and deliberation, when time seemed no object, but only the wish to produce an accurate and beautiful 'copy' for the printer. It is like the delicate, precise handwriting of the Latin races. Throughout his life his handwriting changed but little ; even when it shows rapidity, it is a beautiful flowing script, quite Spencerian in its curves and hair lines.

Examination of these sketches with a magnifier shows rapid work, with much of the drawing done with the brush itself. I see no pencil marks showing any drawing before taking up the brush. Even the coursing of the vessels is largely, if not wholly, rapid brush-work, especially the smaller ramifications. The general outline of a head will be drawn with the brush, rapidly, and with a bold and free sweep. There is no hesitation anywhere, and he is sure of his drawing. He is not making any pictures, to be reproduced as such, but simply feeling his way to the more careful and accurate etching ; and I cannot but believe, too, that the etching itself is made with the dissected parts before him. John Bell ever insisted upon a careful copying of the dissection, and he taught this lesson to his younger brother with his wonted insistence and emphasis,

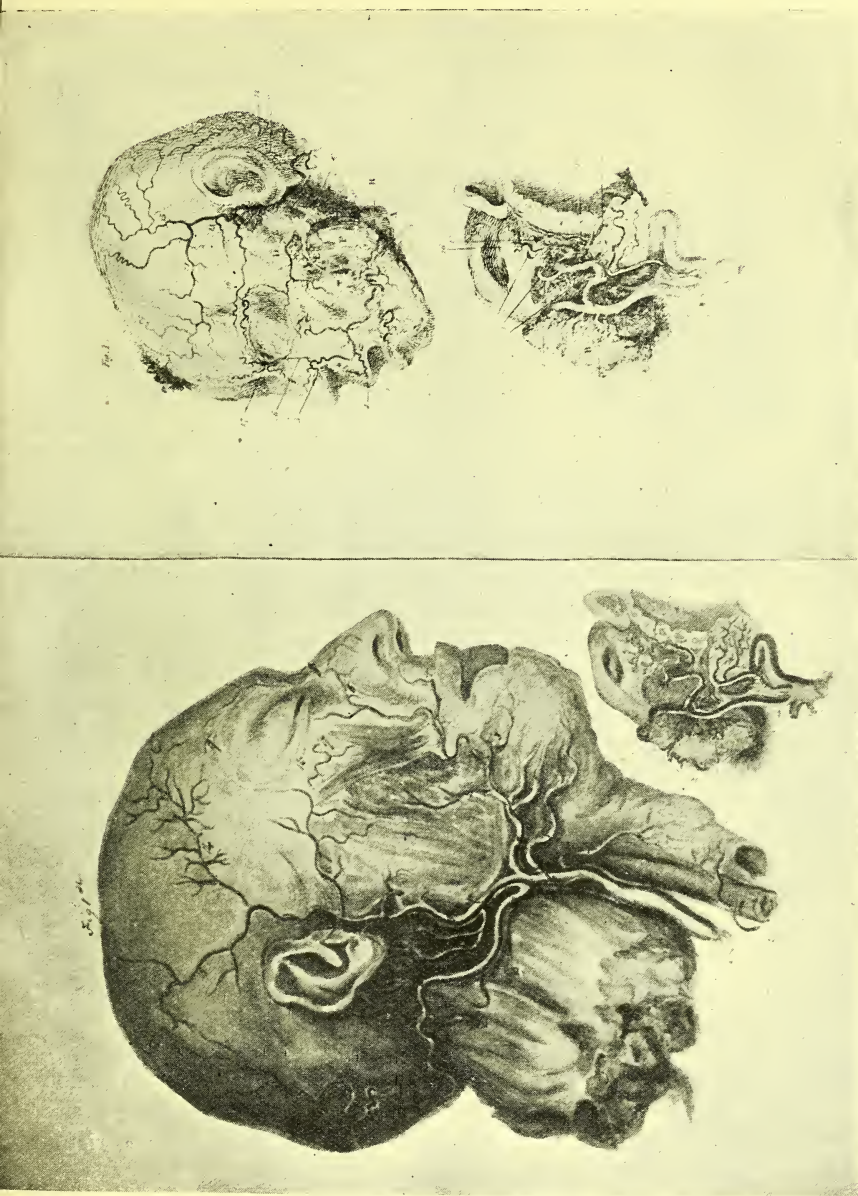


PLATE 5. Drawing and etching showing the arteries of the face. The drawing is much superior. The etching seems to be made from a different dissection. Reduced about one-third.

and that Sir Charles learned his lesson well we have good evidence. Alluding to these very plates, he wrote :

‘I have etched most of the plates with my own hand, preferring accuracy to elegance.’

While it was very evident from his published drawings how prolific his artistic work was, and how great his industry, these sketches give even better evidence of his rapidity and facility. In his first published work, *A System of Dissections*, there are many beautiful plates on a larger scale, which could have been easily reduced for the smaller work ; but, no, his artistic sense and energy demanded new drawings and new dissections, and we have a series of entirely new illustrations ; and additions and improvements in the third edition which make it almost a new work. This in itself shows the artist and the man of science.

A comparison of the sketches with the etchings shows some interesting and suggestive differences. In a way it may be said that as illustrations of dissections there is deterioration in some of the etchings. In the first place, five of the plates are much reduced in size. Size is an important factor in artistic conception, and in the grasp of the architectonic plan of any structure. Reduce Michael Angelo’s David or the Venus of Milo to a one-foot figure, and, no matter how perfect the reduction, how much is lost ! Great as the drawings of Vesalius are as faithful copies from nature, and especially when compared with his predecessors, much of the effectiveness of the faithful copy is lost in the small size. Even his imitators, who simply enlarged these drawings, took a great step forward. We turn the pages of the *De Humanis Corporis Fabrica* more quickly than the pages of the *Tabulae* of Albinus. Compare Sir Charles’s small etchings of the arteries with Maclise’s life-size drawings in Quain’s great work. The etchings are more finished and delicate, but much less effective than the drawings of the less gifted artist, and entirely on account of the size. Of course the two works had different objects in view.

The trend of anatomical illustration is towards larger figures. Where the etching is the same size as the original sketch we can see the improvement from more careful drawing, and the greater distinctness of black and sharp lines. He was undoubtedly influenced in the small size of the other sketches by the subsequent etching. In the reproduction of Plate 5 Sir Charles himself, still influenced by the size of the prospective volume, has committed the error, rare with him, of overlooking the value of relationships in anatomical delineation, for in etching the arteries of the face, he has omitted the great trunk in the neck, well shown in the original sketch, and has etched for us a head cut off close to the base of the skull. A lack of proper relationships is worse than poor drawing. Sir Charles, of course, takes no liberties with his ‘copy’ ; he is always the faithful copyist. But J. Stewart, who etched Plate 3, instead of faithfully copying the right iliac crest, as drawn for him, has seen fit, while Sir Charles’s back was turned, to take every liberty with it, and he has given us a strangely-scolloped bone. He also omitted the os pubis and ischium,

which are in the original, and which give us the relationships of the iliac and beginning femoral arteries. He has, however, introduced the skull, omitted in the sketch, which shows he had the anatomical preparation before him.

While in a few instances the etched artery is better defined than the vessel drawn with the brush, it usually suffers in comparison, for the painted vessel is well accentuated, and even exaggerated. Exaggeration, when properly applied—for only the real artist can use it—is a true principle of art. The Greeks had the audacity to increase the facial angle, and with what marvellous effect! The genius of Michael Angelo put its own limits on bony prominences and swelling muscles, and his drawings and plastic art are good anatomical models to-day.

The sketches as well as the etchings show an ever-present sense of the third dimension. His drawings are never flat. Even in his descriptions of the ligations of the arteries, he is ever mindful of their depth. On this point examine Plate II (Third Edition) showing the femoral with its profunda branches; the drawing is almost stereoscopic. Many beautiful examples could be given to show this quality.

In a general way, it can be seen that Sir Charles has followed the principle which he sets forth in the essay from which I have quoted, namely, that the anatomy should be strongly marked in the sketch, and in the finished picture 'should be gradually softened into the modesty of nature'. While this was probably the prevailing idea one hundred years ago, I am sure the best artists of to-day would modify it. Sir Charles strikes the real key-note of all anatomical delineation when he writes: 'The character of the sketch is spirit and life.' Art is the expression of life, and the more true and intense this expression, the more artistic. If the artist paints the dead body, it must suggest the life which has flown. If he paints the dissected body, the more clearly he shows us the parts in their true relationships with their relative values, the more does he suggest their function, and the more artistic does his work become. The conception cannot be too comprehensive, too general; never yet has its deepest depths been sounded, and never yet has its surface been ever so lightly touched without some artistic response. Sir Charles, of course, is writing of art in general, and this principle is in a way more applicable there than in anatomical delineation proper. But in all his writings and in his most pretentious drawings, his aim ever was to raise anatomical and clinical drawings to a higher artistic level. He writes in one of his letters to his brother George: 'Sometimes I think of finishing my anatomy of the muscles in painting in great style.' This was a great idea and we should endeavour to carry it out to its fullest extent; and if our science of anatomy is to grow into greater proportions and more intimate knowledge of growth, and development, and *function*, its artistic expression must grow with it.

I well remember when a young medical student looking with longing eye at a fine copy beautifully bound of Sir Charles Bell's *System of Dissections* displayed in a shop window, and opened at one of the most

attractive plates, and having to content myself with the two-volume edition of his *Surgery* which I got for a song. And now after many years, I find myself looking at these same plates with even a greater pleasure, and an added appreciation. What is the charm? In what does the excellence consist?

With every true artist some bit of the personality flows out at the end of the pencil, which eludes us and cannot be expressed in words; but there are canons of excellence in Art, which can be expressed, and which we can apply in our estimation of an artistic work, even when it comes to the drawing of the dissected parts of a dead body. Some subjects so lend themselves to the artist's touch that a certain perfection may be attained by talent not of the first order, but when the subject lies outside the usual field—in fact, seems the farthest removed from any artistic treatment—it requires a higher order of talent or genius itself to bring it within the confines of art. And it is wonderful how genius can do this for us. The real secret is, that it brings the dead to life; that in the dead body, it suggests or makes us see the life which has flown; that in the dissected arm, with the muscles and blood-vessels bared, we see these muscles alive and functioning. This is the magic of art; this is the great deception. The mere faithful copyist cannot do this.

The artistic talent of Sir Charles expressed itself in many ways. He used the pencil and the brush, he modelled in wax and plaster, and etched and engraved. He wished through the wax to catch and hold the colours of fresh pathological specimens, and to-day we are striving to do this very thing. I have not seen any of this work; there must be specimens of it somewhere in England.

According to a note in the *Letters* his sketches of the wounded at Waterloo he afterwards reproduced in water-colours, excelling in force and effect any professional paintings hitherto attempted. Many of them, together with some in oil, are now, along with those in the Windmill Street Museum, in the College of Surgeons, Edinburgh, and others in the University College, London. Seventeen were presented by his widow, in 1867, to the Royal Hospital, Netley, along with his note-book. In the Middlesex Hospital he made many drawings of cancer cases, but they seemed to him so distressing to look upon, he could not bear publishing them. This has always seemed strange to me.

It is interesting to note that his earliest published work, his *System of Dissections*, was one of his most pretentious, and in many ways fully characterizes his qualities as an illustrator of anatomy. The drawings show a nice selection of the subject, the point of view from an artist's standpoint, the relationships of the parts with their relative values, and a skilful drawing of the different layers to show depth. There is no hesitation in the drawing; he seems always sure of the form; and whenever the subject admits it, you are aware of the feeling, a fine sentiment always, with touches of local colour and surroundings to give a dramatic interest to the composition.

In Plate 1, for example, in drawing the abdominal muscles, he has not only shown us the three layers, but the muscles which come into relationship with them, and he has so placed his subject that these muscles are made prominent and are seen to best advantage ; and he has drawn for us the dead body itself. It lies stretched out before us with the extended arms, the set features, the relaxed jaw, and staring eyes, well drawn and most striking ; and yet there is nothing repulsive. The dead body itself has become of interest, and we ask involuntarily, ' What manner of man was he ? ' It attracts and holds the attention. This is the dramatic element, which the true artist will always introduce when possible. It has been discarded in modern anatomical drawing, and, I think, to its detriment.

In Plate 6 he has drawn the open chest, with the heart and lungs *in situ*. Cutting through the costal cartilages he has turned back the sternum, showing the anterior mediastinal space better than I have seen it in any modern anatomy, and he brings out besides the courses of the internal mammary artery and the phrenic nerve in a way to impress them for ever on the memory. The drawing is beautiful and striking ; with the eye of the anatomist and the eye of the artist, he has chosen the true point of view, which the artist, by the way, is less apt to miss than the mere anatomist, no matter how well he can name the parts. I showed a drawing of the shoulder-girdle by John Flaxman to an anatomist recently, and he remarked, ' I never quite saw the clavicle before.' It was all the point of view.

Plate 15, showing the femoral and its branches with the nerves on the anterior face of the thigh, is quite the perfection of anatomical drawing—certainly for showing the course of an artery and its deep branches—with the rest of the limb in outline, drawn with faint precision, without one unnecessary line. With consummate skill he shows us the relationship between the anterior crural nerve and the branches of the femoral, and the obturator nerve picked up by a tenaculum. When Sir Charles dissected this thigh, he not only made a skilful dissection, but he saw the true significance of the parts and gave them an artistic expression. This was his genius. To him the dead body was always alive and the impulse to draw it, whole or dissected, was as strong as the impulse to ' frisk it ' when he heard lively music. The drawing pencil was constantly in his hand and his drawings are legion ; and I doubt not many a fine one, worthy of reproduction, lies hidden away somewhere in this great little island.

This work, begun in 1799, was completed in 1803, and at the same time he was making dissections and drawings for his three works on the anatomy of the brain, of the nerves, and of the arteries, work done well before he was thirty. Of his work on the arteries I have already spoken ; of the plates on the nerves, we have good evidence of his skilful dissection and his faithful copying from his subject, for he has drawn the courses of the nerves in delicate lines to their finer ramifications, with the flaccid and widely separated muscles consequent on nerve dissection.

With the modern anatomies before me, and the great advancement in the minute anatomy of the brain, I must confess to the charm and fascination of his plates. Though more than a century has passed, their delicate colouring still holds. But more than that, you see his comprehensive grasp of structure and how skilfully he brought it out. He reproduces but one plate from an outside source, one, of the base of the brain, with the twelve cerebral nerves, from Vic d'Azyr, a bit of anatomy he was afterwards to work out so carefully and to draw for us in his own inimitable way.

And this prompts the observation how wholly his own his illustrations are, and entirely uninfluenced by outside sources. If he copies an old plate it is for its historical value. His treatment, his point of view, is his own always; and, like his brother John, he never published a work which was not all himself.

When Sir Charles went to London in 1804, he carried with him the manuscript of his *Essays on the Anatomy of Expression*, the illustrations for which were to show his ability to give expression to the emotions in portraiture. In the first edition we find a number of little sketches, showing great facility in drawing as well as a keen sense of the delicate shades of facial expression: but quite aside from the merits of the illustrations, both the drawings and the text bring us face to face with the man. However excellent anatomical drawings may be, and individual too, in a way, they cannot reflect the personality of the artist like a work dealing with the emotions and passions described as well as drawn. This work Sir Charles laboured many years to perfect in the succeeding editions; he eliminated much that appeared in the first edition of 1806, and added more, and laboured long to make his drawings what he wished them to be; and in doing all this, he laid bare his own nature with an unconscious abandon. In no other of his works, with the exception of his published letters, do we have revealed to us the man himself—his enthusiasm, his deep insight into structure and function, his general artistic sense and love of the beautiful, his sensibility to the moral and religious in life and art, and finally, a delicate and refined sentiment which pervades all his writings and all his drawings which can give an expression of this feeling. Mere intellectual brightness and smartness seem common enough, but real sentiment, in its best sense, is much less common. It draws a halo around the seeming commonplace; it gives an added push to enthusiasm; it gives a charm even to the drawings of the dissected body. With all our hard facts, let us cultivate sentiment and let us rejoice when we find it in a man of science. Only an artist of a fine and delicate sentiment would have drawn for us the face of the laughing child which closes the introduction to this work.

After Sir Charles went to London, though he carried on with equal assiduity his anatomical researches and his lectures on anatomy, his published drawings were chiefly to illustrate pathology and surgery and the incidents of the clinic. Many figure drawings of patients in the hospital

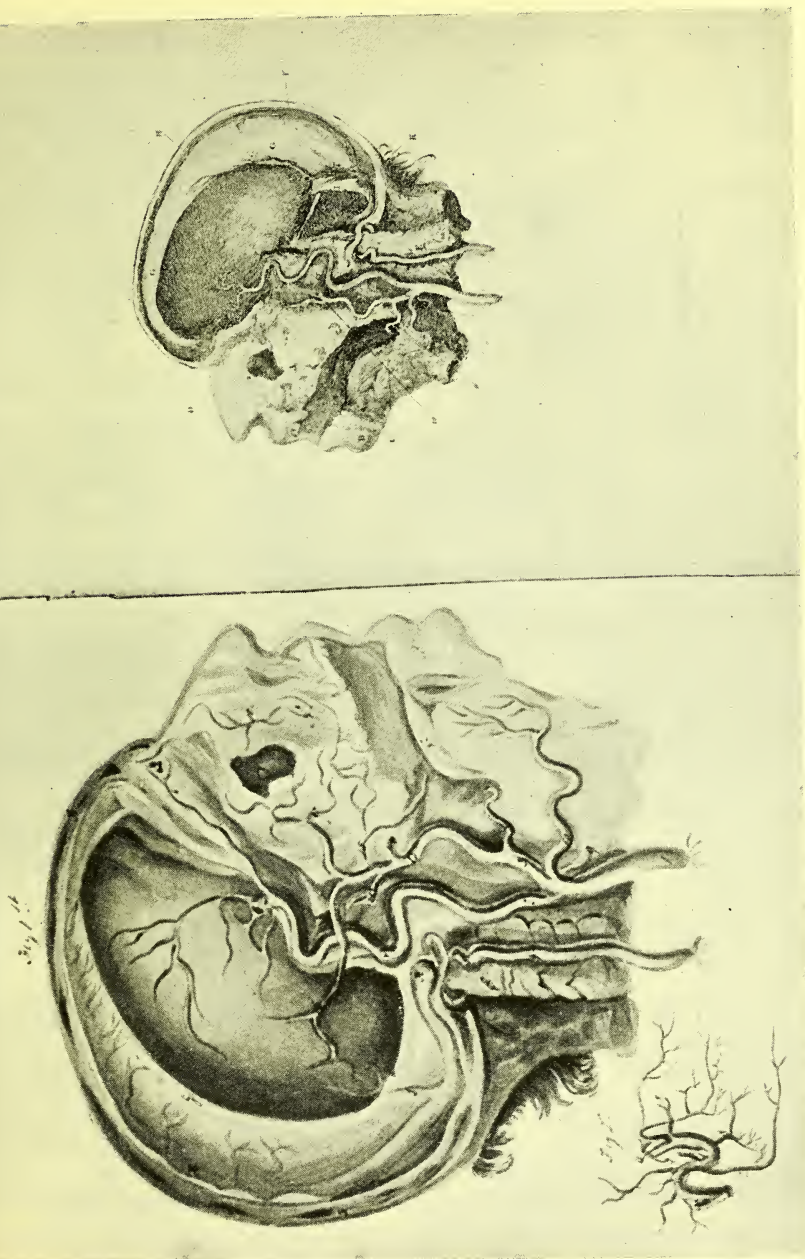


PLATE 6. Drawing and etching showing the internal carotid and vertebral arteries. They show many differences; the drawing is more effective. Reduced about one-third.

are full of expression and sentiment, and you feel at once they are true to the life, and veritable portraits. He made many of these sketches at Portsmouth after the battle of Corunna, and in Brussels after the battle of Waterloo, and Baron Larrey, years later, recognized many of them on a visit to London. He conceived the idea of elaborate paintings and portraits, showing the patient and the disease. This seems to me a great idea. We may well take it up, for I see ahead the time when the advanced stages of malignant disease will be a rarity indeed, will pass away, in fact, and the medical historian will have to search past records to find the clinical features of inoperable cancer. They will be prized like the portraits of an extinct race. Many of his figure drawings, though mere outlines, showing malignant tumours, are of greatest value. His brother John had this gift of rapid sketching; but he was more inclined to complete the picture. One of his sketches, however, seems to me to surpass anything of Sir Charles's as evidence of deep feeling. It is his sketch of the case of Alexander Macdonald, evidently sarcoma of the arm.¹ Quite aside from its scientific value, he has made its pathos beautiful—a classic face of long suffering, and the dishevelled hair almost like a wreath of laurel for the heroic fight of a brave spirit with death. The young man was dying when he made this sketch. He has brought a malignant tumour within the confines of art; and no amount of mere skill in drawing can do this alone.

I cannot emphasize too strongly the value of these clinical sketches. Entering the hospital one morning he comes to a case of dislocation of the head of the femur, and near by, one of fracture of its neck; and he draws for us most skilfully the clinical features: shortening, rigidity, and inversion of the foot in the one, and eversion, shortening, and preternatural mobility in the other; we have nothing in modern illustration quite so good.

He conceived the idea of elaborate and artistic drawings of operations, and carried it out beautifully, drawing instruments *in situ* and the operative hand at work, or indicating the objective point of the operation. In his *Surgery* especially are many of these little sketches in outline, always with an expressive hand holding an instrument, and showing at a glance what it would take a page to describe.

Though Sir Charles did so much for artistic delineation in anatomy and medicine, and wrote so much on the value of anatomy to the artist, it is only in passing references and hints in his letters that he has anything to say of the application of art to anatomy and medicine—to us, at least, a much more important subject. He did think anatomy of great use to the artist, both in painting and statuary, and he has given us strong reasons for his belief. In this he went farther than his brother John, who, while admitting its value, considered it rather limited and sharply defined; unless controlled by genius, the anatomy was apt to become too conscious a part in the conception and execution. But a great book is yet to be written on the value of art to anatomy and medicine.

¹ *The Principles of Surgery*, by John Bell, London, 1808, vol. iii, p. 82.



John Bell's sketch of Alexander Macdonald, showing the artistic drawing of a malignant tumour.

Choulant,¹ in his admirable work on the history of anatomical delineation down to 1850, has done much in an historical and bibliographical way to show the advances from ignorance and fancy to the true copying from nature ; but the real application of the principles of art to anatomy, and all it will mean in the future development of that science, await its expounder. Certainly if we are to attract artists to anatomical studies, the anatomy itself should be treated from an artistic standpoint. We must bring art to anatomy before we carry it to the artist ; they can be made reciprocal. But the greatest influence of art applied to anatomy will be in its teaching, and in making this teaching most effective. A study of mere form or structure without its life is the most barren of all studies. He who sees the form without the life back of it, sees nothing ; and the more we make the form give expression to its life, the more truly artistic it becomes.

The time must come when the dissecting room will offer not only the dead body for dissection, but will help show in every way the life of its parts. Dissecting the muscles of an arm, the student will have by him the well-developed arm of the athlete to show the muscles alive.²

Sir Charles, as I have said, conceived the idea of anatomical delineation on a grand scale, but only partially attempted to carry it out. If we can get an Abbey to paint for us ' The Holy Grail ', let us have an equally great artist paint for us the dissected body, that we may best grasp its life. It would be a great stimulus to anatomical study. Only then will our anatomy become truly significant ; only then shall we have a real artistic anatomy ; and then what seemed commonplace will become interesting and even beautiful.

The genius of Sir Charles Bell was towards this end ; it was his genius to discern the function back of the form, and with a confident and ready hand to draw for us what he saw. He had the artistic sense of proportion, of relationship, of relative values, of the point of view ; and with it all that delicate and beautiful sentiment which coloured his life as well as his art. It was indeed Goethe's *milde Macht* and the *Sweetness and Light* of Matthew Arnold.

¹ *Geschichte und Bibliographie der anatomischen Abbildung, nach ihrer Beziehung auf anatomische Wissenschaft und bildende Kunst*, von Dr. Ludwig Choulant, Leipzig, 1852.

² Sir Charles had this very idea and carried it out in a way in his lectures (see a paper by Dr. W. W. Keen in the *Transactions of the VIIth International Medical Congress*, 1881, ' On the Systematic Use of the Living Model as a Means of Illustration in Teaching Anatomy '). The best modern work which has come to my notice which treats of artistic anatomy with a living model is *Plastische Anatomie des menschlichen Körpers für Künstler und Freunde der Kunst*, von Dr. Julius Kollmann, Leipzig, 1910.

[Thursday Afternoon, August 7]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

EXTRAITS CHOISIS SUR LE 'FEU DE
SAINT-ANTOINE'

PAR M. LE DOCTEUR CHAVANT, DE GRENOBLE

I. DÉNOMINATIONS ET ORIGINES

L'APPELLATION de Feu ou Mal de St. Antoine n'a prévalu que depuis le culte voué à ce Saint, c'est-à-dire vers le milieu du XI^e siècle. Encore cette dénomination était-elle plutôt régionale. Mais à l'étranger et pendant la période antérieure au XI^e siècle, différents noms furent adoptés pour désigner la même maladie :

' Ignis sacer,' chez les Latins.

' Esthiomenos,' chez les Grecs.

' Ignis occultus,' ou feu caché.

' Ignis infernalis,' ou feu infernal.

Mal de St. Marcel.

Mal persique.

Mal géhennal.

Feu-Dieu.

Mal des ardents.

Toutes ces appellations désignent le même mal.

Le Feu sacré paraît remonter à une haute antiquité. Virgile y fait allusion dans les *Géorgiques* (livre iii).

' . . . Ne longo deinde moranti
Tempori contractos artus sacer ignis edebat.'

De ces deux vers du poète latin, Delille a tiré les vers suivants :

' Son corps se desséchait et ses chairs enflammées
Par d'invisibles feux paraissaient consumées.'

Lucrèce dans le *De natura rerum*, livre vi, vers 66, s'exprime ainsi :

' Sacer ignis et urit corpora serpens
Quancumque arripuit partem repit que per artus.'

(Le Feu sacré consume les corps, il envahit une partie et atteint les articulations.)

En France la première apparition du mal sacré remonte au ^xe siècle. Du moins, nous n'avons pas de documents nous permettant d'affirmer sa présence avant cette date. Le plus ancien monument qui le signale est la chronique de Flodoart pour l'année 945. Il se montra de nouveau en 993 (Rodolphe, Livre des Incendies).

D'après Mezeray, en 995 et 996, le Feu sacré sévissait avec une telle intensité qu'il emporta en peu de jours plus de quarante mille personnes dans l'Aquitaine, l'Angoumois, le Périgord et le Limousin. Vers 1090 il fait son entrée dans le Dauphiné et c'est ici que se place l'histoire si intéressante de l'Abbaye de Saint Antoine.

II. SYMPTÔMES. 3 PÉRIODES

1^{re} Période de début

L'invasion était brusque : le Feu de St. Antoine ne s'annonçait pas longtemps d'avance. La victime était surprise en pleine santé, sans distinction d'âge, de sexe, de condition.

Le malade commençait à ressentir une douleur aiguë et lancinante, généralement à l'une des extrémités (mains ou pieds). Très rapidement cette douleur allait en s'accroissant au point d'arracher des cris à ces malheureux. En même temps on apercevait sur le membre atteint une 'tache noire'. Cette tache d'abord petite et lisse gagnait rapidement en surface et en profondeur et formait par rétraction de la peau comme des élévures ou rides, ce qui donnait au membre atteint l'aspect d'une brûlure noirâtre.

Sauval (Antiquités de Paris) s'exprime ainsi :

'Chaque membre qui était attaqué devenait noir comme un charbon.'

Ces premiers symptômes étaient accompagnés de frisson et de fièvre. Le malade était terrassé, le corps entier était brûlant, la langue saburrale : il y avait de la céphalalgie avec tout le cortège ordinaire des symptômes communs aux maladies fiévreuses.

2^{re} Deuxième période ou période d'état

Au bout d'un temps relativement court, généralement vingt-quatre ou quarante-huit heures, le mal avait envahi une large portion du membre atteint ; c'était la main ou le pied en entier, quelquefois le Feu sacré atteignait d'emblée jusqu'à l'articulation du coude ou du genou. La circulation veineuse était interrompue et par stase sanguine la gangrène s'établissait. Le membre atteint devenait insensible aux éléments extérieurs ; il ne réagissait ni au froid ni à la chaleur : on pouvait le piquer sans éveiller de sensation, mais malgré ces phénomènes de mortification, la douleur du membre persistait, ardente, lancinante, vrai feu dévorant et consumant.

Il arrivait parfois que le Feu sacré atteignait d'emblée la deuxième période. Il procédait, disent les contemporains, avec une telle rapidité qu'en l'espace d'une nuit les malheureux voyaient avec épouvante un bras ou une jambe envahis par le terrible mal. On rapporte le cas d'une femme que sa famille conduisit à St. Antoine pour y être hospitalisée et qui perdit sa jambe pendant le voyage.

Alors la fièvre atteignait les limites extrêmes au-delà desquelles l'homme ne saurait résister. Les souffrances étaient portées à leur maximum d'intensité et les malades se sentaient brûlés vifs comme avec du feu. Horrible supplice, torture épouvantable auxquels la mort venait mettre fin comme une délivrance.

L'agonie survenait en général vers le troisième ou le quatrième jour. Rarement le malade dépassait sept jours ou alors c'était la guérison.

Sauval s'exprime ainsi :

' Les douleurs étaient comparables à celles d'un cancer et ce qu'il y a d'étonnant c'est que ce mal causait d'abord de la chaleur, ensuite un froid intense, si bien que le malade ne pouvait arriver à se réchauffer.'

Vers le quatrième ou le cinquième jour, l'aspect de la tache noire avait un peu changé, elle prenait une consistance ramollie. Les muscles rongés par le mal dévorant s'affaissaient privés de vie et se séparaient de l'os par lambeaux.

' Ces symptômes, dit A. Paré, s'accompagnaient de sueurs froides, de délire, de syncopes et de hocquets.

' Et auparavant qu'ils meurent, ont tous une sueur universelle froide avec délire ou rêveries, syncopes ou évanouissements, roulements et hocquets, à cause que les vapeurs de la putréfaction et pourriture sont communiquées et portées par les veines, artères et nerfs aux parties nobles.'

Vincent de Beauvais, dans sa chronique de Sigebert, en 1090 s'exprime ainsi :

' La tache noire causait une ardeur insupportable, desséchait la peau, pourrissait les chairs et les muscles qui se détachaient des parties osseuses et tombaient par lambeaux.'

3^o Troisième Période. Guérison

' Si tous étaient frappés ils n'en mourraient pas tous.' Ceux qui étaient assez robustes et qui pouvaient atteindre le septième jour ou le huitième avaient quelques chances de guérison. Mais c'était le petit nombre, presque l'exception.

La fièvre diminuait d'intensité, les souffrances s'atténuaient et devenaient plus supportables. Le membre se desséchait, la peau devenait moins racornie, comme un parchemin noir. Il se produisait une sorte de momification analogue à celle que nous observons sur les cadavres embaumés. Le membre était mort, il pendait inerte. Cet état durait une ou plusieurs semaines, ensuite la partie inerte tombait d'elle-même,

se détachant petit à petit comme une branche sans vie se sépare de l'arbre vivant qui la porte.

Cette chute se produisait sur une large étendue. Tantôt c'était une main qui se détachait, tantôt un pied, quelquefois un membre entier. Chose remarquable et qui fut observée et relatée souvent par les contemporains, en s'amputant d'elle-même la partie morte laissait une cicatrice naturelle très résistante.

Physiologiquement, cette chute de lambeaux n'est pas une exception dans l'histoire de la médecine et n'est pas particulière au Feu de St. Antoine. Le même phénomène naturel se reproduit dans un certain nombre de maladies.

En première ligne vient la Lèpre, qui avec un processus beaucoup plus lent fait tomber de petits lambeaux, généralement une phalange à la fois. Citons encore les panaris, les gangrènes traumatiques. Dans le même ordre d'idées, nous constatons des faits similaires à la période de convalescence de certaines affections aiguës. L'épiderme tombe par lambeaux dans la fièvre typhoïde, la scarlatine, la variole, l'érysipèle, etc.

Il faut donc considérer cette séparation du tissu sain et du tissu mort comme un processus naturel de guérison.

Nous verrons plus loin qu'il existait un autre mode de guérison, celui-là artificiel et pratiqué par les frères hospitaliers de St. Antoine, c'était *l'opération chirurgicale : l'amputation.*

III. L'ABBAYE DE SAINT-ANTOINE

Le corps de Saint-Antoine ermite fut rapporté de la Haute-Égypte par Jocelyn, seigneur de Chateaufort-de-l'Albenc, vers l'année 1080. *C'est de cette époque que date la fondation de la basilique actuelle de St. Antoine, laquelle ne fut achevée qu'aux XIII^e et XIV^e siècles.*

A cette époque, le Feu sacré exerçait ses ravages. De toutes parts les malades accouraient pour chercher leur guérison auprès des reliques de St. Antoine.

Un peu plus tard, en 1095, deux nobles pèlerins, Gaston et Gerin, venus en pèlerinage à St. Antoine, furent touchés jusqu'aux larmes par le spectacle qu'ils avaient devant les yeux. La chapelle était encombrée d'infirmités qui disputaient au fléau leurs membres déjà brûlés par le Feu sacré. Justement émus à la vue de ces misères, ils firent le vœu de fonder un ordre d'hospitaliers. Ils trouvèrent huit hommes de bonne volonté et ces dix créèrent ainsi l'ordre des Antonins qui devait devenir célèbre dans le monde entier.

A partir de ce moment et durant tout le Moyen Âge les épidémies sévirent variables dans leur intensité. Parfois le fléau paraissait avoir disparu et tout-à-coup il renaissait plus cruellement.

En 1200, Saint-Hugues, évêque de Lincoln, fit un pèlerinage à Saint-Antoine. Le récit de ce voyage nous a été conservé par Adam, moine

bénédictin, qui était à la fois son biographe et son chapelain. Voici un passage de cette relation :

‘ Là (à Saint-Antoine) nous vîmes des malades en grand nombre. Il y avait des jeunes gens et des jeunes filles, des vieux et des jeunes, sauvés du Feu sacré par St. Antoine. Leurs chairs étaient à demi brûlées, les os consumés, *coupés aux jointures et ils vivaient à l'état de demi-corps*, mais joyeux d'être guéris. . . .’

Les malades qui avaient été guéris et qui portaient le nom de ‘démembrés’ continuaient à vivre sous la protection des Antonins. Un médecin chargé du service de cet hôpital recevait soit en espèces, soit en nature, des honoraires qui peuvent s'estimer à cent écus par an.

En recherchant dans les archives des différents notaires qui se sont succédés à St. Antoine, nous avons retrouvé des documents relatifs au fonctionnement de l'hôpital.

L'arrivant était examiné par le conseil des officiers ecclésiastiques dont faisait partie le Grand Prieur et aussi par les ‘démembrés’ actuellement hospitalisés ‘afin que ceux-ci reconnussent bien que le nouvel admis avait droit aux soins et aux avantages réservés aux démembrés’.

IV. PROSPÉRITÉ DE L'ABBAYE

La prospérité de l'Ordre et de l'Abbaye de St. Antoine fut rapide. Ils achevèrent la Basilique dans les siècles qui suivirent sa fondation. Chaque année de grands pèlerinages s'organisaient à l'occasion des fêtes de l'Ascension et de la Pentecôte. Aux processions on portait la châsse de St. Antoine et nombre d'autres reliques et ornements.

Les visiteurs étaient nombreux. On voyait accourir les représentants de tous les États. Les grands de la terre ne dédaignaient pas de venir à St. Antoine. Citons : Charles VII, Louis XI, François I^{er}, les Dauphins, Charles IV d'Allemagne, Sigismond, empereur d'Allemagne, le Pape Martin V, Charles VIII, roi de France, les ducs de Savoie, etc.

V. DEUX ANECDOTES RÉCENTES

L'ordre hospitalier de St. Antoine fut réuni à celui de Malte en 1775. Néanmoins depuis cette époque jusqu'à nos jours le Feu sacré se montra sous forme de cas isolés dans la région du Dauphiné. Nous citons deux exemples récents :

L'abbé L... nous a raconté ceci :

‘ En 1880, je fus appelé pour adminstrer une femme nommée Thérèse dans le village de Tréminis, canton de Mens, Isère. Là, je vis une malade âgée d'environ 50 ans qui paraissait souffrir d'une façon atroce et qui poussait des cris perçants. Les souffrances étaient tellement intenses que la pauvre femme ne pouvait articuler une seule parole et que je dus renoncer à la confesser. Jugeant l'état très grave, je me mis en devoir de lui administrer l'extrême-onction. Pour cette cérémonie je cherchai un pied. Je ne le trouvai pas.

‘Où est le pied ? demandai-je.

‘ — Ah ! Monsieur le Curé, il y a longtemps qu’il est parti.

‘ — Comment parti ?

‘ — Il est tombé de lui-même noir et pourri.

‘ En effet, la jambe existait encore, je reconnus l’os tibia mis à nu vers son extrémité inférieure. Quant au pied, il avait disparu. La partie qui restait du membre était noire comme du charbon. La malade succomba le surlendemain dans des souffrances terribles. On me dit que la maladie datait de trois jours avant mon arrivée. Ce qui fait au total une évolution d’environ 6 jours.’

Le cas suivant m’a été raconté par un docteur de Grenoble qui le signalait comme singulier et rare :

‘ On m’appela, dit-il, au village de Nantes-en-Rattier (Isère) pour donner des soins à un homme qui avait une jambe absolument desséchée et momifiée. Je jugeai l’amputation nécessaire : elle fut suivie de guérison. Le mal avait débuté brusquement et évoluait avec rapidité sans qu’on puisse en déterminer la cause exacte. C’était un cas de gangrène sèche, absolument comparable aux descriptions anciennes du Feu sacré ou Mal de Saint Antoine.’

VI. TRAITEMENT DES MALADES

A. *Traitement moral et religieux*

Nul n’ignore les ressources que la médecine retire de l’influence morale. De nos jours, comme dans tous les temps, le malade est soulagé quand on a ouvert à son cœur la porte de l’espérance.

Le mot consolateur qui tombe de la bouche du médecin est un sorte de manne bienfaisante qui réconforte et ranime l’être humain mieux que ne sauraient le faire les plus puissants médicaments.

A plus forte raison, ce phénomène se produisait à St. Antoine lieu déjà célèbre et dont le prestige s’étendait au loin. Il arrivait là de tous les coins de l’Europe des légions de malades qui se sentaient atteints mortellement. Incapables de marcher, ils se faisaient porter par leurs parents ou leurs amis et s’ils ne mouraient pas en route leur espoir renaissait à mesure qu’ils se rapprochaient du lieu saint.

Voici, d’après Dassy, dans quelles formes était admis un malade à l’hôpital de St. Antoine :

‘ Lorsqu’un infirme arrivait à l’hôpital, l’heure de la charité sonnait, les frères quittaient toute autre préoccupation et volaient au secours du malheureux. De l’hôpital on se rendait à l’église. On déposait le malade devant la châsse de St. Antoine en récitant une oraison dont voici quelques passages :

“ Antoine vénérable pasteur, qui éteignez le Feu infernal . . . et vous, Seigneur, qui accordez au bienheureux Antoine votre serviteur la guérison des malades du Feu sacré et la résurrection de leurs membres.” (Prière tirée d’un livre d’heures, manuscrit très ancien.)

Ensuite un frère puisait dans un vase destiné à cet unique objet quelques gouttes d’une liqueur privilégiée qui avait coulé sur les ossements de St. Antoine et les présentait à boire à l’infirme.

Souvent, au terme de sept jours les vœux du malade étaient exaucés et la guérison accomplie.

B. Traitement chirurgical

Quand un malade se présentait à l'hôpital des Antonins, il était reçu par les frères de l'aumône qui remplissaient leurs délicates fonctions avec dévouement et fidélité.

On prodiguait au malade les premiers soins et, si les infirmiers le jugeaient à propos, on lui déclarait qu'il devrait subir l'opération pénible de l'amputation. A ce sujet, il est permis de se demander à quelle période de la maladie se trouvait indiquée l'opération. Les documents nous manquent sur ce détail. Mais il est bien probable que le frère infirmier ne tranchait le membre malade que lorsqu'il était complètement envahi par la gangrène.

A ce moment l'amputation ne présentait pas grand danger car il n'y avait pas d'hémorragie à craindre, les vaisseaux du membre atteint étant eux-mêmes desséchés et brûlés.

L'amputation était-elle très douloureuse ? nous ne le pensons pas. Elle était plutôt impressionnante. D'ailleurs le malade qui se prêtait à cette opération avait ressenti pendant plusieurs jours les douleurs atroces du Feu sacré et en comparaison de cette brûlure continuelle l'amputation d'un membre inerte était bien peu de chose.

Quoi qu'il en soit, l'opérateur devait être choisi comme le plus habile. De même que les chirurgiens de cette époque mettaient une certaine coquetterie à manier adroitement la lancette et à frapper à coup sûr la veine céphalique de leur client, de même le frère hospitalier chargé de l'amputation devait avoir à cœur de réussir adroitement et sans hésitation.

Le but de l'opération était de conserver une partie du membre atteint et d'empêcher un plus complet envahissement par la gangrène.

Les membres ainsi sectionnés par le frère infirmier étaient conservés 'et formaient une sorte de collection d'ex-voto' : ils résistaient à l'action de l'air et à la destruction causée par les germes, sans qu'on prit aucune précaution pour les en préserver.

Dans quel but les frères hospitaliers conservaient-ils ces lambeaux humains nomifiés ? Peut-être par respect religieux et pour ne pas détruire les membres séparés d'un corps qui doit se retrouver entier au jour du jugement dernier dans la vallée de Josaphat, ou bien leur plaisait-il de garder comme dans un musée les pièces anatomiques résultant des opérations, comme font les chirurgiens de nos jours.

Les lignes suivantes, extraites de l'ouvrage de Dassy, contiennent une observation de deux visiteurs relative à la conservation des membres amputés :

'Vers 1639, on annonça à l'abbé Danthon la visite de deux pèlerins de la science, Dom Durand et Dom Martenne, confrères de Monmajour et des Annalistes et voici un extrait du rapport qu'ils firent sur leur visite :

'“ Nous vîmes, disent-ils, des démembrés, *quelques-uns entièrement sans pieds, d'autres sans mains, ceux-ci sans pieds et sans mains.* Un frère nous

montra des membres coupés il y a plus d'un siècle qui sont semblables à ceux qu'on coupait tous les jours, c'est-à-dire noirs et secs."

Sur la châsse de St. Antoine on voit représenté un 'démembré'. Il est assis, son bras gauche est amputé au niveau du poignet. La ligne de section est trop nette et trop régulière pour qu'on puisse croire à une chute naturelle du membre gangrené. C'est donc un malade qui vient d'être opéré par le frère infirmier. Ce qui confirme cette idée, c'est que l'opéré porte encore une écharpe pour soutenir son bras et adoucir la sensation pénible et persistante produite par l'opération.

Tout près de ce malade 'démembré' se trouvent d'autres infirmes porteurs de béquilles et sans doute démembrés aussi.

Les indigents qui avaient subi l'opération de l'amputation se trouvaient dans l'impossibilité de gagner leur vie. Mais ces pauvres gens n'étaient point abandonnés. Les réglemens des Antonins portaient que ces démembrés appartiendraient désormais à l'asile. Jusqu'à la fin de ses jours, l'infirmes était vêtu, nourri, logé à l'hôpital.

L'anesthésie chirurgicale au Moyen Âge

Chose curieuse, les praticiens de cette époque avaient entrevu et pratiqué l'anesthésie qui est le triomphe de l'art moderne. Guy de Chauliac, en 1363, s'exprime ainsi :

'Abreuvez d'opium, de suc de morelle, de jusquiame, de mandragore de ciguë, de laitue, une éponge neuve et faites-la dessécher au soleil. Et quand il en sera besoin, mettez celle éponge dans l'eau chaude et la baillez à flairer tant que le sommeil en vienne au patient. Et luy, endormy, faites l'opération. . . '

Ainsi les opérateurs de cette époque n'étaient pas aussi ignorant qu'on pourrait le croire. Ils avaient de réelles connaissances et se conformaient à la direction de maîtres compétents et instruits.

C. Traitement médical

Les Pères Antonins employaient pour leurs malades atteints du Feu sacré plusieurs médicaments dont les formules nous ont été conservées par les auteurs de cette époque.

Nous nous contenterons de citer : un *cataplasme* pour la gangrène, un *emplâtre résolutif et astringent* (composé notamment de céruse, alun et rose rouge). A l'usage interne on administrait aux malades la *thériaque saxonne* qui agissait surtout comme calmant, car elle contenait entre autres ingrédients du sirop de pavots.

POST-FACE

Nous ne saurions terminer cette histoire du Mal de Saint-Antoine sans prononcer *un mot d'admiration* à la mémoire de ces *hommes du Moyen Âge* qui n'ont pas craint de se dresser courageusement en face d'un danger formidable et de braver la mort dans un but de charité.

Soulager leurs semblables, sauver quelques épaves de notre pauvre Humanité, voilà les ressorts qui les faisaient agir. Dévouement sublime et exemple réconfortant pour notre nation, démontrant une fois de plus que la France a toujours été la patrie du devoir et du sacrifice.

Saluons d'abord ces nobles figures : Gaston et Gerin et leurs six collaborateurs qui fondèrent au ^{xr}e siècle la 'Confrérie des Frères de l'Aumône'.

Après eux vint la nombreuse cohorte des religieux, hospitaliers, abbés, pères Antonins, frères 'donnés', frères 'convers', frères chirurgiens, qui tous, plus ou moins, apportèrent leur concours à la grande œuvre et prirent part à *cet élan de charité qui dura huit cents ans*, qui résista aux guerres et aux multiples bouleversements de cette époque et accueillit successivement sous son égide protectrice les lépreux, les pestiférés, les affligés du 'Feu de Saint-Antoine' et toutes les épaves souffrantes de l'Humanité. Exemple remarquable de constance et d'abnégation qu'on retrouverait difficilement de nos jours.

Ces moines étaient en même temps philanthropes et savants, prêtres et médecins. Accueillants et consolateurs pour les misères morales, ils savaient aussi soulager les infortunés physiques et tout en goûtant les douceurs de la vie contemplative ils ne perdaient pas de vue leur rôle de bienfaiteurs. Au besoin ils savaient montrer la fermeté du soldat. Qu'on se rappelle que pendant le troisième pillage de l'abbaye, deux religieux se retirèrent dans la tour fortifiée du cloître : c'étaient noble Michel de Sains-Jullien et Frère François Charréard. A eux deux, seuls ils tinrent en échec la troupe entière des envahisseurs.

En ces temps de troubles et de misères, il ne fallait rien moins que de tels hommes.

Reportons notre pensée à dix siècles en arrière et voyons dans quel milieu vivaient les Pères de St. Antoine. C'est l'époque des Croisades, des guerres féodales, des guerres contre l'Angleterre et l'Allemagne. Toujours la guerre, la guerre partout.

A ces horreurs ajoutez l'apparition de fléaux tels que la peste ou le Feu sacré et vous aurez un tableau peu rassurant de l'état de notre pays. Au milieu de tous ces maux, il fallait être de véritables apôtres pour entreprendre de lutter contre un ennemi autrement plus dangereux que la guerre : contre la contagion et les épidémies.

Qu'on n'objecte donc pas que les Antonins avaient une compensation dans leurs richesses et que pour cette raison ils étaient des heureux, des privilégiés de ce monde. Cette fortune immense édifiée par la seule reconnaissance des peuples et des grands de la terre, ils la payèrent parfois chèrement et au prix de leur vie, scellant ainsi de leur sang la rançon de leur prospérité. Comme tous les apostolats, l'histoire des Antonins eut ses martyrs. Il suffit de rappeler *l'épisode sanglant et la fin tragique de Mr. Charles de la Cardonnière, religieux de Saint-Antoine*.

Le lundi quatre juillet 1580, aux premières lueurs de l'aurore, les religieux sont réunis dans l'église de Saint-Antoine pour l'office de 'Primes'. A l'autel un vieillard aux cheveux blancs célèbre les saints mystères. C'est Monsieur d'Arzac de la Cardonnière.

Tout à coup arrive du dehors un bruit étrange. Des sabots de chevaux résonnent sur le parvis du sanctuaire, des cliquetis d'armes, des cris féroces se font entendre : c'est une troupe de 140 Huguenots dont 30 sont à cheval. Les religieux, soit par surprise soit par la force que leur donne leur caractère sacré, restent impassibles dans leurs stalles. Le service divin continue. Le premier huguenot qui franchit le seuil faillit être précipité sur les dalles de la Basilique par suite d'un faux pas de son cheval, ce que l'historien Piémont a interprété en disant qu'il fut obligé malgré lui de faire la révérence. A sa suite pénètre la troupe des fanatiques, saisie de respect devant le calme de ces moines qui récitent leur office sans paraître entendre les injures qui leur sont adressées. Cette indifférence irrite les envahisseurs. Un chef interpelle le célébrant qui se contente de joindre les mains pour appeler sur la terre la clémence du ciel. Soudain quelqu'un a crié : Feu ! C'est le signal du carnage. Les Huguenots se précipitent. L'officiant est renversé au pied de l'autel. Un poignard est levé sur lui et il ne faut rien moins que l'intervention d'un chef, pour lui laisser la vie moyennant une rançon.

Le soir, après le sac de l'Abbaye, les pillards se replient sur le village de Chevrières. Huit religieux capturés comme otages sont enchaînés et doivent suivre la colonne. L'infortuné de la Cardonnière ne peut plus aller : ce vieillard nonagénaire sent ses forces l'abandonner. C'est alors que le capitaine de la troupe nommé Muguet de Die, lui fracasse la tête d'un coup de pistolet et abandonne son cadavre sur la route.

Si vous visitez la Basilique de Saint-Antoine, ne manquez pas de vous faire indiquer au pied du maître-autel, l'empreinte qui marque l'endroit où tomba le martyr et quand vous aurez contemplé cette dalle vénérable, qui fut rougie du sang du père Antonin, vous revivrez par la pensée ces heures tragiques où les voûtes sacrées de l'immense vaisseau retentirent des cris des victimes et furent témoin de la profanation causée par les hordes du baron des Adrets.

Pour nous, quand nous nous trouvons en présence de ces vestiges, troublants évocateurs des siècles passés, nous ne pouvons nous défendre d'un sentiment d'admiration et de respect à l'égard de ces hommes, véritables héros pour ces époques troublées, qui poussaient l'esprit de sacrifice jusqu'à se faire massacrer plutôt que d'abandonner le poste de combat où les avaient placés les premiers efforts de la civilisation et l'amour de l'Humanité.

Frères hospitaliers, fondateurs de l'ordre des Antonins, vous fûtes sublimes !!

Vous aviez à affronter à la fois l'aspect répugnant des malades et le danger perpétuel de la mort : deux forces qui dépassent généralement le dévouement humain et qui font reculer les hommes les plus courageux. Vous êtes doublement héroïques. Votre mémoire restera à la postérité aussi belle et aussi pure que celle du soldat qui court à la mort pour sauver sa patrie.

[Thursday Afternoon, August 7]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

DE L'EMBAUMEMENT ÉGYPTIEN ET DE SES
QUALITÉS ANTIPUTRIDES

PAR M. LE PROF. DR. L. REUTTER, DE GENÈVE

Le problème angoissant de la destinée de l'homme après la mort est celui qui a le plus préoccupé les personnes de tous les temps, dès l'aube de l'histoire jusqu'à nos jours, et nous tâchons par tous les moyens scientifiques de conserver à l'abri de la putréfaction les corps de nos grands hommes et de nos illustrations contemporaines. Aujourd'hui, demain, comme hier, l'être humain qui se sent orgueilleusement le roi de la Création, se demande avec anxiété : 'Que serai-je lorsque la mort impitoyable aura tranché le fil de mon existence ?'

Qu'est-ce que demain me réservera après le trépas ? Quel est-il ? Le néant d'avant la naissance ! L'aurore d'un jour radieux et sans fin ! Le terme de tous nos maux ! La réalisation entière de tous nos rêves, de toutes nos espérances, de tout notre idéal ! La paix, le repos, la tranquillité promise ?

Hélas, aucun de nous ne peut répondre à ce dilemme et nous cherchons par tous les moyens à en rendre l'énigme moins épouvantable, et à lutter parfois contre la sentence biblique 'Et in pulverem reverteris'. Quand on voit l'action dissolvante de tous ces infiniments petits que la mort déchaîne quelques heures seulement après son œuvre et que Pasteur dénomme 'microbes', quand quelques jours suffisent pour transformer un être aimé en une chose sans nom, tant elle est répugnante et hideuse ; nous comprenons que dès la plus haute antiquité, les peuples aient été soucieux de leurs devoirs envers leurs défunts, et qu'ils aient cherché, soit dans l'art de l'embaumement de conserver leurs cadavres, soit dans l'immersion ou l'incinération, d'anéantir entièrement les restes de ceux qui leur furent chers, avec qui ils avaient vécu, souffert et qu'ils avaient aimés.

Nous comprenons la manière de voir de Pierre Pomet,¹ ancien marchand épicier en la bonne ville de Paris, lorsqu'il s'écrie :

'Tous les Éléments ont partagé la dépouille des morts, la Terre n'ayant pas été jugée digne et capable d'être seule chargée de ces dépôts. L'Histoire nous apprend que le feu a brûlé et consumé les corps des Grecs,

¹ *Histoire générale des Drogues simples*, Paris, 1694.

des Romains, des Gaulois, des Allemands et de plusieurs autres nations ; que ceux de la Colchide pendoient et branchoient leurs morts à des arbres et que les vieillards du Septentrion ont trouvé leurs sépultures dans les Abîmes de l'Océan, aussi bien que les Éthiopiens dans le courant des eaux et que les peuples de la froide Scythie ont été ensevelis dans les neiges.'

Mais comme nous l'avons décrit dans notre livre *De l'Embaumement avant et après Jésus-Christ*¹ dédié à Messieurs Maspéro et Delattre, Membres de l'Institut de France, les anciens Égyptiens embaumaient les corps de leurs proches, pour qu'au jour du jugement dernier, leurs âmes pussent retrouver en parfait état de conservation les dépouilles mortelles qu'elles avaient habitées. Car, poussés par leurs prêtres, ils imaginèrent les théories du double ou du bi, voltigeant au-dessus des tombeaux, se nourrissant des sacrifices offerts, et devant retrouver sa dépouille mortelle pour pouvoir exister. Ils se mirent donc en mesure de préparer les cadavres qui, de par les conditions spéciales du sol et du climat, se conservaient d'eux-mêmes à l'abri de la putréfaction.

Cette coutume curieuse ne remonte pas aux hommes de l'époque prédynastique, qui se contentaient d'abandonner ceux que la mort avait fauchés au milieu des plaines arides et sablonneuses du désert, à la lisière des bois ou au bord des cours d'eau. Puis on les ensevelit, couchés sur le côté dans une fosse peu profonde où l'on constata qu'ils se conservaient très longtemps.

Les croyances religieuses s'étant spécialisées, on se mit en devoir d'aider dame Nature et d'envelopper les restes humains dans des sacs en toile. On déposa près d'eux des urnes ou récipients contenant les aliments et les boissons nécessaires à leur subsistance dans l'au delà, des armes de guerre et de chasse, des engins de pêche, etc., comme cela se pratiquait d'ailleurs chez tous les peuples primitifs. Ainsi fut institué l'art de l'embaumement au sujet duquel les écrivains et les scribes d'alors sont muets, à l'exception d'Hérodote et de Diodore de Sicile.

Les prêtres sacrificateurs instituèrent des Coachytes, des Tarycheutes, etc., habitant la maison dite de *l'embaumement*, chargés de préparer les cadavres, de pratiquer sur eux les incisions rituelles, de les tremper dans les bains de natron, de les entourer de bandelettes, de les oindre, de peindre divers hiéroglyphes et dessins et de déposer près d'eux des amulettes qui devaient les accompagner et leur aider à ouvrir les portes de l'au delà.

Les prêtres sacrificateurs habitaient, avec les prêtresses et leurs nombreux desservants, des maisons spéciales sises dans l'enceinte du temple, où ils préparaient dans des laboratoires spéciaux les huiles et les onguents sacrés, utilisés à l'onction du dieu et de la Momie, les encens divers servant à la sanctification des lieux du culte, voire même les parfums, les collyres, les graisses si appréciées des belles mondaines de l'Égypte antique.²

¹ D^r L. Reutter, *De l'embaumement avant et après J.-C.* (Vigot frères, éd., Paris, 1912).

² *Des parfums égyptiens*, par le D^r Reutter, dédié à Monsieur Héron de Villefosse, Membre de l'Institut de France.

Ces embaumeurs ne momifiaient pas tous les cadavres de la même façon ; ils distinguaient, selon Hérodote, trois modes de conservation et retiraient pour chacun d'eux une somme déterminée, variant entre 4,500 francs et 93 francs de notre monnaie courante.

Nous ne pouvons, crainte d'être fastidieux, relater ici leur méthode de procéder, ni entrer dans tous les détails que nous avons déjà énoncés dans nos travaux, devant nous contenter d'énoncer rapidement certains faits peu connus, vu que les Tarycheutes, les Coachytes, les prêtres sacrificateurs tenant à conserver leurs secrets, ne les divulguèrent à âme qui vive, pas même à leurs vainqueurs, les Romains.

C'est ce qui explique les raisons pour lesquelles les égyptologues modernes, de même que les écrivains antiques, ont tant de peine à déceler quelle était la composition des masses résineuses utilisées dans la préparation des parfums et des masses servant à l'embaumement.

Ils cherchèrent naturellement, comme de nos jours encore nos parfumeurs, à perfectionner leurs produits de sorte que nous ne pouvons tabler sur une ou plusieurs analyses pour certifier l'emploi usuel de telle ou telle substance. En tout cas l'encouragement moral suivant, dû à la plume du célèbre égyptologue M. Maspéro, nous donnera une nouvelle force pour arriver à sonder ces mystères.

Voici ce que le successeur de Mariette écrit dans la *Revue critique d'Histoire et de Littérature*¹ : 'Les substances utilisées par les prêtres égyptiens varièrent grandement selon les époques, c'est ce qu'on ne doit pas oublier, quand on se livre à des études du genre de celles que M. le Docteur Reutter a entreprises si heureusement.'

Permettez-moi, Messieurs, de vous énoncer ici quels en furent les résultats et de vous esquisser succinctement la marche suivie pour y arriver.

Les masses résineuses utilisées par les anciens ne forment pas, généralement, un tout homogène, de sorte qu'il est nécessaire de les séparer, si faire se peut, les unes des autres.

On prend alors pour chacune d'elles son point de fusion, son indice d'acidité, son indice de saponification, en conséquence son indice d'éthers. Le premier de ces indices, n'existant malheureusement pas toujours, nous permet de présumer la présence du natron, le déshydratant par excellence des anciens, qui se combine aux albuminoïdes et qui joua dans l'embaumement égyptien un rôle très important, mais nous ne pûmes le déceler dans les masses résineuses provenant de Carthage.

Nous y parvîmes en soumettant les masses résineuses égyptiennes pulvérisées à l'action de l'eau bouillante, qui dissout aussi les hexoses et pentoses provenant soit d'un vin de palmier, soit de la pulpe d'un fruit (casse tamarin). On parvint aussi à déceler dans ces solutions certains corps à tannin (henné) ou corps amers contenus dans plusieurs résines.

Une analyse qualitative nous permit, grâce aux réactions spécifiques

¹ *Revue critique d'Histoire et de Littérature*, Paris, 1912, Ernest Leroux, éd., 16 novembre, n° 46.

de certaines résines,¹ de déceler la présence ou de déterminer l'absence des corps suivants : storax, styrax, bdellium sandaraque, gomme ammonique, galbanum, myrrhe, etc. — voir pour plus de détails nos deux ouvrages précités dans lesquels nous mentionnons certaines réactions spécifiques nouvellement étudiées et décrites dans le cours de nos analyses.² Une petite quantité de résine dissoute dans de l'éther que l'on évapore abandonne un résidu qui, soumis à l'action de la chaleur, nous permet aussi de conclure à la présence ou à l'absence de la térébenthine, dont l'odeur est caractéristique.

Il est évident que cette dernière substance ne peut provenir de l'Amérique, non encore découverte, mais qu'elle doit, ainsi que les drogues précitées, avoir été livrée par des plantes originaires soit de l'Égypte, soit de pays limitrophes à celle-ci, soit de pays se trouvant en relations commerciales avec elle, n'en déplaît à quelques chimistes qui prétendent avoir décelé du baume de Canada dans le cours de leurs analyses.

Afin de nous assurer si nos résultats d'analyses qualitatives étaient exacts, nous soumîmes ces différentes résines à l'analyse quantitative, ayant soin de les soumettre préalablement à la distillation aux vapeurs d'eau pour les priver de leurs essences.

Nous les avons dissoutes à cet effet successivement dans de l'éther, dans de l'alcool, puis dans du chloroforme et du sulfure de carbone, ces deux derniers solvants étant reconnus comme capables de dissoudre l'asphalte ou bitume de Judée. Nous obtenons ainsi une solution éthérée que nous agitions successivement avec des solutions aqueuses de carbonate d'ammonium, de carbonate de sodium, du bisulfite de sodium et de potasse caustique, qui combinent les acides libres des résines et saponifient parfois leurs combinaisons. Ces solutions aqueuses décantées, privées à l'aide de la distillation de leur éther, puis versées dans de l'eau acidulée y précipitent les acides résineux, résinoliques, etc., qui s'étaient combinés à la potasse ou au sodium.

Ces dépôts recueillis, reprecipités par précipitation fractionnée, purifiés à l'aide de la cristallisation spontanée, nous permettent d'isoler ainsi les uns des autres les divers acides que nous soumettons à l'analyse quantitative. Les résultats des combustions, c'est-à-dire le pour cent en oxygène, en carbone, en hydrogène, en azote, voire même en soufre, les poids moléculaires décelés, les points de fusion, l'action polarimétrique de ces divers acides, nous permettent par comparaison avec les résultats obtenus par M. le professeur Tschisch³, de conclure à la présence de tel ou tel acide ainsi que de la vanilline. Le reste de la solution éthérée évaporée est saponifiée pendant quarante-huit heures avec de la potasse caustique alcoolique ainsi que le résidu obtenu par évaporation de la

¹ Voir D^r L. Reutter, *De l'embaumement avant et après J.-C.* (Vigot frères, éd., Paris, 1912), et *Analyses des parfums égyptiens*.

² 'Analyse d'une résine carthaginoise entourant les restes momifiés d'un prêtre,' *J. de Ph. et de Chimie*, 1913.

³ Voir *Die Harze und Harzbehälter* von Tschisch, Leipzig, 1910.

solution alcoolique. Nous obtenons ici par précipitations fractionnées les résines et le styrol et les divers acides que le natron des anciens ou l'auto-oxydation avaient combinés ou oxydés. Les parties insolubles dans ces divers solvants sont formées soit de matières inorganiques tels que sable, poussière, détritrus des urnes soit de parties végétales ayant servi à aromatiser ces masses.

Nous nous permettons de joindre ici comme exemple les résultats analytiques concernant les résines ayant servi à la momification de l'amiral égyptien Hekan-M-Saf, pensant intéresser nos nombreux confrères.

Ces conclusions furent présentées le 25 septembre 1911 par M. Maspéro à l'Académie des Sciences de Paris, qui a bien voulu les publier dans ses comptes rendus (tome 153, p. 597, *Comptes rendus de l'Académie des Sciences de Paris*).

Cette résine est formée de morceaux friables, de couleur rouge brunâtre, un peu pointillés sur la face interne (marque des pores), et de couleur brune noirâtre sur la face externe qui est luisante ; elle pèse en tout 40,2 gr. Examinée à la loupe, elle ne forme pas une masse homogène, et la résine englobe différents corps que nous examinons successivement.

1^o Des pierres dures, anguleuses, pesant 1,3 gr., formées de carbonates de chaux, de magnésium et de sodium, de phosphates de chaux, de sulfates de magnésium, de sodium, de calcium et de barium, de silicates de calcium, de magnésium, d'aluminium, de chlorures de sodium et de magnésium, tout en recélant des traces d'arsenic, de chrome et de fer.

2^o Des pierres grisâtres, friables, pesant 1,1 gr., formées de carbonates de chaux et de magnésie, de phosphates de chaux et de sodium, de sulfates de chaux, de silicates d'aluminium, de calcium, de magnésium, tout en contenant des traces de chrome et de fer.

3^o Des objets précieux et d'ornement.

4^o Des morceaux de bois d'odeur aromatique, pesant 1,28 gr., qui, examinés au microscope, proviennent d'un bois appartenant à la famille des conifères (cyprès ou cèdres).

5^o Des petits morceaux de résine jaune brunâtre, pesant 0,48 gr., d'odeur balsamique térébenthinée provenant probablement de la térébenthine de Chio.

6^o Des morceaux résineux, anguleux, de couleur jaune brunâtre, dont nous ne pouvons préciser l'origine, vu le peu de substance mis à notre disposition.

7^o Des morceaux résineux allongés, plastiques, d'odeur térébenthinée, provenant probablement de la résine de cèdre, pesant 1,4 gr.

8^o De la résine proprement dite, qui, examinée chimiquement et microscopiquement, donne les résultats suivants :

(a) De styrax, provenant du *Liquidambar orientalis*, comme le prouve la présence de l'acide cinnamique, fondant à 133° ; de la vanilline, du styrol, qui, par oxydation, donne de l'acide benzoïque fondant à 121°.

(b) De la résine d'Alep, du *Pinus halepensis*, comme le prouve l'essence obtenue par la distillation aux vapeurs d'eau, essence d'odeur térében-

thinée, et l'acide halépopinique, que nous obtenons en agitant une solution éthérée de cette résine avec du carbonate d'ammoniaque. Corps fondant à $73,5^{\circ}$ et donnant, soumis à la combustion :

<i>Trouvé.</i>	<i>Formule.</i>	<i>Qui calculée en % donne.</i>
C = 75,6 H = 9,45	$C_{21}H_{32}O_3$	C = 75,9 H = 9,64

Cette formule correspond exactement avec celle que M. le Dr Schulze trouva pour l'acide halépopinique, sous la direction de M. le professeur Tschisch, à Berne (voir sa *Dissertation inaugurale*, page 14, et *Die Harze und die Harzbehälter* de M. le professeur Tschisch, Leipzig, 1906, p. 588).

(c) De mastic, de la plante *Pistacia lentiscus*, comme le prouve l'acide masticinique obtenu par agitation de la solution éthérée avec du carbonate d'ammonium, qui fond à 92° et donne, soumis à la combustion, les résultats suivants :

0,1384 gr. de substance donnent 0,3721 gr. CO_2 et 0,1151 gr. H_2O , correspondant à :

<i>Trouvé.</i>	<i>Formule.</i>	<i>Qui calculée en % donne.</i>
C = 73,3 H = 9,2	$C_{23}H_{36}O_4$	C = 73,4 H = 9,57

L'acide β -masticonique obtenu par les agitations avec du carbonate de sodium :

<i>Trouvé.</i>	<i>Formule.</i>	<i>Qui calculée en % donne.</i>
C = 76,9 H = 9,8	$C_{32}H_{48}O_4$	C = 77,4 H = 9,7

et la *masticorèse* ne donnant :

<i>Trouvé.</i>	<i>Formule.</i>	<i>Qui calculée en % donne.</i>
C = 77,3 H = 10,2	$C_{35}H_{56}O_4$	C = 77,78 H = 10,37

Formule correspondant à celle que nous avons personnellement trouvée en analysant le mastic sous la direction de M. le professeur Tschisch (voir *Die Harze und die Harzbehälter*, Leipzig, 1906, p. 472) et la dissertation du susnommé.¹

(d) D'essence obtenue par la distillation aux vapeurs d'eau, possédant le poids spécifique de 0,9801, l'indice de réfraction $n_d 20^{\circ}$ 1,46614 et le pouvoir rotatoire $-22^{\circ}35$, que nous pouvons considérer comme étant de l'essence de cèdre.

(e) D'asphalte, que nous fondons avec de la potasse caustique pour obtenir un composé, dont la solution aqueuse additionnée d'acide chlorhydrique dégage de l'hydrogène sulfureux.

(f) De sable quartzueux et marneux.

(g) De parties végétales, qui, examinées au microscope, proviennent de plantes, appartenant à la famille des conifères, cèdres ou cyprès, aux dicotylédones, *Liquidambar orientalis*, etc.

(h) De natron, comme le prouve l'alcalinité de l'eau qui renferme

¹ Ueber Mastix Caricari Elemi und über verschiedene Gräberharze aus Kartiago, Inaugural-Dissertation von L. Reutter, Apotheker, Bern, 1904.

des carbonates, des chlorures et sulfates de *sodium et de potassium* etc. ; des parties minérales donnant à l'analyse les résultats suivants : présence de carbonates, silicates, phosphates, chlorures, nitrates, sulfates de sodium, de calcium, d'aluminium, de magnésium, et des traces d'arsenic, de chrome, de fer et de manganèse.

(i) De corps résineux ayant subi une oxydation lente, ou de substances résineuses, non-déterminées quant à leurs analyses chimiques, soit :

<i>Trouvé.</i>	<i>Formule.</i>	<i>Qui calculée en % donne.</i>
C = 90,3 H = 2,1	$C_{30}H_8O_2$	C = 90,0 H = 2,0

(j) Du sucre provenant probablement d'un vin de palmier et réduisant la solution de Fehling.

Nous trouvons donc que les 40,2 gr. de la résine susnommée se décomposent comme suit :

1,3	gr. de pierres dures.
1,1	„ de pierres grises.
1,2	„ de copeaux de bois, cèdre ou cyprès, liquidambar.
1,4	„ de résine de cèdre.
0,98	„ d'objets de parure.
13,85	„ de natron, sable et parties végétales.
19,68	„ de résines provenant du mastic, du styrax, du baume d'Alep et de l'asphalte.
0,69	„ de résines non-déterminées.

Total 40,20 grammes.

Nous ne pouvons entrer ici dans plus de détails. Nous mentionnerons toutefois que la résine carthaginoise entourant le corps momifié d'un prêtre de Carthage était formée d'un mélange de mastic, de styrax, de copal, d'asphalte et d'opoponax sans avoir été préalablement additionné de natron. Ces conclusions furent présentées à l'Académie des Inscriptions et Belles-Lettres par Monsieur Héron de Villefosse, qui écrivait ce qui suit quant à ces analyses : ¹ 'Monsieur Reutter a reçu les encouragements des savants éminents et il a étudié les questions de l'embaumement avec une passion véritable'; de son côté M. le prof. Jéquier², un égyptologue lui-même, écrivait dans le *Sphinx* : 'Il faut donc espérer que les directions des divers musées voudront bien communiquer au Docteur Reutter d'autres échantillons de résines, pour que l'on puisse alors entreprendre une histoire sérieuse de la momification. Car son livre est une première contribution, un travail très méritoire indiquant une voie nouvelle à suivre.'

Nous eûmes aussi l'honneur d'être approuvé par les Perrot, les Bourquelot, les Tschirch, les Schäer, etc., en ce qui concerne nos résultats

¹ *Comptes rendus de l'Académie des Inscriptions et Belles-Lettres*, Paris, mai 1912, fol. 156.

² Extrait du *Sphinx*, vol. xv. 6, par G. Jéquier.

chimiques, et par des maîtres de la médecine, en ce qui concerne l'histoire de l'embaumement à travers les âges.

Malheureusement, nous ne sommes pas encore arrivés au but, aussi nous permettons-nous d'émettre un vœu qui peut-être sera entendu de tous : Puissent les divers musées, les nombreux savants que l'égyptologie intéresse, nous soutenir tant au point de vue pécuniaire que dans l'envoi de nouvelles masses à analyser. Ainsi pourrions-nous parvenir malgré nos faibles forces à sonder ce passé mystérieux qui, comme le dit Monsieur le D^r Fouquet, doit être étudié non seulement au point de vue zoologique, médical, botanique, égyptologique, etc., mais surtout au point de vue chimique.

Car les masses résineuses qui entourent ces momies vénérées nous permettront, une fois analysées, de décrire non seulement les formules de leurs compositions, mais aussi d'entrevoir quels étaient les pays entretenant des rapports commerciaux avec l'Égypte, quels étaient les plantes connues, quel était l'état des connaissances pharmacognostiques d'alors.

Ces masses, ces corps embaumés qui provoquent toute notre admiration, cette sortie du tombeau, ce trait d'union entre le passé et le présent, émerveille l'homme et le laisse songeur, surtout en ces temps de matérialisme et de réalisme. Cette vénération profonde, cette abnégation de tout notre être, cette piété filiale qui permettaient à nos devanciers de tout sacrifier, temps et argent, au repos de l'âme de leur père, font un étrange contraste avec nos idées actuelles.

Il nous reste une dernière question à élucider : Dans quel état matériel trouvons-nous ces corps embaumés, que Monsieur le D^r Fouquet¹ décrit comme suit :

‘ Une momie bien conservée des prêtres d'Ammon, quand on l'a privée de ses bandelettes, apparaît avec les jambes étendues et rapprochées parallèlement, les bras ramenés le long du corps ou légèrement croisés au-dessus du pubis. La peau est partout lisse et propre, absolument rasée, seuls la barbe, les cheveux, les sourcils et les cils sont conservés. La bouche, les narines, les yeux et les oreilles sont recouverts d'une couche de cire vierge hermétiquement collée et saupoudrée de résine de cèdre (Note de l'auteur). Sous la cire, la bouche close cache les dents, les lèvres sont teintées en rouge, et noircies par le temps. Les sourcils sont peints, les paupières souvent ornées de Kheul, le visage fardé ainsi que les pieds et les mains et quelquefois même tout le corps, qui a le plus souvent gardé une partie des formes replètes qu'il avait pendant la vie.

‘ Le cou est relativement maigre et sous les paupières mi-closes et bombées se trouve une boulette de chiffons sur laquelle le dessin de l'iris est grossièrement représenté.

‘ Les narines quand on les débouche laissent voir le chemin par lequel un crochet traversant l'ethmoïde a permis, grâce à un courant d'eau, d'extraire suivant l'usage la matière cérébrale.

¹ *Note pour servir à l'histoire de l'embaumement en Égypte*, par le D^r Fouquet, Le Caire, 1896, fol. 6.

Les bras, les jambes, les mains, l'abdomen ont un embonpoint moyen, mais la peau sèche, cassante, a conservé son grain, voire même sa couleur blanc jaunâtre. Nous ne pouvons décrire ici les plaies classiques, ni les exceptions que nous résumâmes dans notre livre *De l'embaumement avant et après Jésus-Christ* et que nous nous permettons d'offrir, ainsi que nos autres travaux, à Sa Majesté le Roi de la Grande-Bretagne et à la Société anglaise d'Histoire de la Médecine en témoignage de notre profonde estime et de notre grande admiration.

Ainsi grâce à leur patience, à leur haute connaissance scientifique, à leur amour filial, les Égyptiens nous transmirent des données certaines, qui nous permettent de sonder ce passé mystérieux, de reconstituer l'anthropologie des habitants du Nil, d'élucider bien des points ténébreux de l'histoire de leurs Pharaons. Mais il est aussi de notre devoir de rendre hommage à l'abnégation, au savoir, à la ténacité des Mariette, des Maspéro, des Delattre, des Benedite, des Naville, des Jéquier, etc., qui parvinrent après de patientes et laborieuses recherches à sonder l'écriture imagée des Égyptiens, à reconstituer leur vie, à découvrir leurs tombeaux, à élucider bien des points ténébreux de l'histoire des Pharaons.

Car l'influence égyptienne se retrouve même dans l'art de l'embaumement des Carthaginois, des Guanches, etc., comme nous parvînmes à le démontrer dans notre ouvrage.

Malheureusement ces momies égyptiennes n'ont pas joui en paix de leur dernier sommeil. Les Perses et les Arabes ayant introduit dans la thérapie du moyen âge et dans celle du temps de la Renaissance le bitume de Judée, des juifs, des chrétiens peu scrupuleux ne redoutant pas comme les Coptes actuels le bi des anciens possesseurs du Nil, spolièrent leurs mastabas, leurs pyramides et leurs tombeaux pour vendre sur le marché européen des parties de corps momifiés. Ils se mirent même à préparer eux-mêmes des momies falsifiées recommandées et présentées par les Esculapes d'alors qui préconisaient même d'utiliser l'exudat découlant des corps putréfiés ou de momifier des pendus — voir pour plus de détails notre livre dédié à Monsieur le professeur Perrot, *De la Mumia vera ou d'un médicament démodé*.

Permettez-moi de vous présenter encore quelques conclusions auxquelles de longues et patientes recherches concernant l'embaumement à travers les âges m'ont permis d'arriver.

Les analyses chimiques des corps résineux découverts dans les urnes, dans les sarcophages égyptiens et carthaginois, ont suffisamment prouvé que les Anciens utilisaient pour la conservation des cadavres des mélanges de substances provenant d'arbres indigènes, puis de l'asphalte ou baume de Judée, des baumes tel que le styrax dont les effets sont antiputrides grâce à sa contenance en acide cinnamique. En s'aidant de la dessiccation favorisée par le climat, le terrain et (pour les Égyptiens du natron, corps déshydratant par excellence), ils parvenaient à embaumer les corps de leurs proches et à les conserver.

Dans nos pays moins bien partagés pour le climat et pour le sol, nous

devons recourir, comme nous l'avons vu, à des moyens plus énergiques pour conserver les corps.

Il nous paraît pourtant que la méthode dite ancienne, combinée avec la méthode contemporaine, permettrait de conserver les cadavres d'une manière plus durable ; aussi nous permettons-nous de préconiser ce qui suit :

Le corps destiné à l'embaumement serait injecté dans ses vaisseaux premièrement avec la liqueur du Dr Parcelly, puis avec celle du Dr professeur Laskowsky, selon la manière usuelle. Grâce à ces liqueurs, on en a la preuve, la bonne conservation des tissus organiques est assurée. Malgré l'aversion du public pour une autopsie partielle du cadavre, nous croyons que l'extraction des viscères et des intestins ne serait pas superflue.

Elle pourrait éventuellement se faire par l'anus au moyen d'un liquide décomposant les parties organiques que l'on désirerait éliminer. Ce lavement serait suivi d'une injection de glycérine, d'alcool amylique contenant du sublimé corrosif, voire même de l'injection d'un mélange de styrax, de térébenthine de Venise et de baume du Pérou, pour en remplir les cavités.

Mais, revenant à la méthode ancienne pour éloigner les mouches, les insectes et les empêcher de déposer leurs œufs sur le corps à conserver, il nous paraît alors utile, après l'avoir bien désinfecté, de l'enrouler dans des bandes en flanelle, imbibées de glycérine phéniquée. On imprégnerait en outre ces bandelettes d'un mélange composé de styrax et de baume du Pérou connus de par leur teneur en acide cinnamique comme anti-putrides, par leur odeur aromatique éloignant les insectes, et l'on additionnerait ces baumes de mastic, de térébenthine de Venise, qui sont bon marché, et d'asphalte ; ces substances intercepteraient l'humidité du sol et de l'air, en rendant les tissus plus adhérents.

On déposerait en outre dans le cercueil, tout autour du cadavre, des résines pulvérisées, telles que l'encens, la myrrhe, la colophane qui sont d'un prix relativement peu élevé.

Puissent nos populations toujours plus éclairées par l'instruction approfondie qu'on leur donne, comprendre que le cadavre d'un cher disparu peut encore être utile après sa mort à la société, soit au point de vue anatomique, soit au point de vue histiologique, ce qui permettra à nos futurs savants d'élucider bien des points obscurs, soit au point de vue anthropologique, soit au point de vue physiologique et par l'embaumement de comparer dans une vingtaine de siècles l'état de la race d'alors avec celle de ses devanciers.

En émettant ce vœu, je crois être l'interprète des Sociétés d'histoire de la Médecine et particulièrement *de la Société française d'Histoire de la Médecine au nom de laquelle j'ai eu l'honneur de prendre la parole.*

[Thursday Afternoon, August 7]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

THE LESSER WRITINGS OF JOHN ARDERNE

BY D'ARCY POWER, F.R.C.S., ENGLAND

Introduction. Saxon Leechdom and the treatment of disease by herbs and charms, which was its characteristic feature, lingered in England long after the Conquest. Little by little it was replaced by the newer teaching of Salerno and Montpellier, introduced by the learned men who frequented the court of Henry I, and from the courts it gradually filtered downwards to the practitioners who treated the mass of the people. We know very little at present about surgery in Saxon times, and John Arderne is the earliest English surgeon about whom we have any detailed knowledge. He lived through the fourteenth century, and was essentially a general surgeon who practised amongst all classes, first in the wars, then at Newark, last of all and as an old man in London. He was held in high esteem by his contemporaries, who admitted him to the guild of surgeons in London, and his teaching was appreciated by his successors, as is proved by the numerous manuscripts of his writings which exist both in the original Latin and in English translations. I edited one translation, made early in the fifteenth century for the Early English Text Society, in 1910, and the knowledge I then gained of Arderne's life and character led me to think it would be worth while studying the rest of his treatises as a guide to the quality and nature of the knowledge possessed by an English surgeon in the fourteenth century.

Account of Arderne. A few details of Arderne's life and times will render his position more easy to understand. He was born in 1307, and was certainly writing as late as 1376, and perhaps for some years afterwards. During this period much happened at home and abroad, for Arderne lived through the reign of Edward III, that 'noble King Edward for whom no honour is too great', as Jean le Bel says. He was in some way attached to John of Gaunt, and he knew personally many of the great men of the Hundred Years' War with France, men whose names and deeds are now household words, for they were celebrated by Jean le Bel and by Froissart. At a time when chivalry reached its highest development Arderne lived with the most chivalrous, and he had treated,

or heard at first hand about the treatment of, Sir James Douglas (1286–1330) perhaps when he was in Flanders or in Spain. Arderne seems to have visited Ireland, Flanders, Algeçiras, and Guienne. He gives a few facts about his experiences in each place, as well as a short but interesting table of words in French, Flemish, and Irish, with their English equivalents. He settled at Newark-on-Trent in the year 1349, perhaps because the ravages of the Black Death caused a temporary cessation of hostilities and compelled the military surgeons to seek a more peaceful method of gaining a livelihood. He practised at Newark until 1370, when he moved to London, and was admitted into the Fellowship of Surgeons, a small guild distinct from the Fellowship of Barbers. Arderne seems to have begun his writing after he settled in London, and he published the results of his long experience in a series of Latin treatises dealing with different subjects of medical importance. These treatises were issued separately, for they are arranged in different order in the various copies of his collected works which are still extant. But it is clear from the number of these copies that the treatises were much read by his contemporaries, and they were soon translated into English for the use of the less learned brethren. Most of the manuscripts are fragmentary, but the British Museum contains a beautifully illustrated copy of what may be called the 'opera omnia' (Sloane MSS., No. 2002), and Emmanuel College, Cambridge,¹ possesses the complete works in the form of a translation made early in the fifteenth century.

The most important of these treatises is undoubtedly that upon *Fistula in Ano* and *fistulae* generally, about which it is unnecessary to speak at any great length as I published an English translation of it for the Early English Text Society in 1910. It is sufficient to say that it shows Arderne at his best, a surgeon worthy to be classed with his great contemporary Guy of Chauliac (1298?–1368), though, unlike Guy, he seems to have remained a layman until his life's end.

The lesser treatises deserve rather more attention than has been given to them, and I have, therefore, taken the opportunity of the establishment of this historical section of the Seventeenth International Congress of Medicine to devote a short time to their consideration.

The Mirror of Blood-letting. The first treatise, which has no title, must be quoted like the well-known 'circa instans' by its first words, which are 'Hoc est Speculum Phlebotomiae' or 'The Mirror of Blood-letting'. It is a practical treatise giving general directions for minution dealing with the season, the age of the patient, and the part from which blood should be let in different diseases. There is no doubt as to its authorship,

¹ The MS. is numbered 69 in the Western Manuscripts in the Library of Emmanuel College. Dr. Montague Rhodes James describes it as 'Paper, $8\frac{1}{4} \times 5\frac{3}{4}$, ff. 210, 29 lines to a page. Cent. xv, clearly written with curious drawings. Stamped leather binding of cent. xvi.

'Collegio Emmanuелиs sacrum posuit Humfredus Moseley armiger et sociorum commensalis 1649.

'Collation 1¹⁸ [15, 16 canc.], 2¹²–16¹², 17⁶, 18⁴, 19², 20² [four left last stuck to cover].'

for it is full of the Latin tags familiar to every reader of the tracts on fistula. Arderne shows a belief in the effects of the moon on bleeding, but adds very sensibly that patients must not be blooded in very hot or very cold weather; that old men who have not been used to bleeding should not be let blood, and that children under twelve years of age bear bleeding badly. He quotes Rhazes, Galen, Avicenna, Ptolemy, as though the texts of a Latin version lay before him. A prescription is given 'for to make an ointment for cancer of a man's yard', clearly with hæmorrhage. It consists of lard, white wax, and red dock. These ingredients are to be mingled with 'the fat of one hog', an amount which we know to have been about five pounds, since the whole animal at this period rarely weighed more than forty pounds. Arderne's Saxon training comes out in this formula as well as in a second; the preparation of another ointment against cancer where he directs that filipendula—the dropwort—is to be taken on a Thursday before sunrise with a paternoster, and in the charms which are recommended to staunch bleeding from the nose. One of these charms consists in writing certain characters and suspending the writing about the neck of the patient, or in writing them on the haft of a knife with which a pig is afterwards killed. A hazel twig, too, may be split, and the head of the patient is put through the loop, the sign of the cross is made on the forehead, and the invocation is uttered. A styptic powder is also ordered for use in bleeding piles and for the relief of too profuse menstruation. It is noteworthy that Arderne is free from any marked astrological ideas and that it is only in the translations executed in the next century that extensive interpolations occur in this tract regarding lucky and unlucky days and the influence of the constellations on the letting of blood.

A formula for making Greek fire. The next page or two of the manuscript deals with a method of making Greek fire, and is written in French. Greek fire is essentially a preparation of turpentine, which is called in Arabic 'alkitran', and in other languages 'Terebintine'. It has marvellous virtues—unspecified—and when live sulphur is added to it, as in Spain, it makes horrible sores.

The book of Simples. The book of Simples, which has no definite beginning, opens with the following list of names for herbs and diseases in French and other languages. It seems worth while to give it in full, but it is impossible to tell now whether Arderne jotted it down for his own guidance or whether it is an echo of his early travels.

'In ffrancia that is to saye in fraunce they callene herbes these names that folowene

Nele i. (e). pople.
Ineray i. darnell.
Drew i. drawke.
Ambesoy n i. karloke.
Blewet idem est.
Cheleye i. mathe.
Lusecte i. tarre.
Weldyllon i. edgrowe.

Stocorgone i. Beere.
Chavener i terra (ubi sennaterra).
Chaveney s i. seed.
Cannere i. hemepe.
Eanynot i. burres.
Brounce i. underwode.
Bronce i. birche.
Anne i. Aldere.

— i. molberye.
 Thefthorne beryes bee called ffyles.
 Veroles i. pokkes.
 Mewyre de hay i. hoppes.
 Brere beryes.
 Botone de hay i. hoppes.
 Swye i. soot.
 Sene i. sape darbres.

Swete i. talowgh.
 Bostons i. halt.
 Bosue i. brokeryggyd.
 Berblettz i. whelkes.
 Rugoles i. mazelys.
 Clowle i. schepyscabbe.
 Egryme i. saxifrage.

Brevere i. lynghe.
 Ceneles i. hawes.
 Cinus i. hawthorne.
 Noyaws i. kernell.

Of Applys and of other ffrut Arest
 de boyz i. qwynse.
 ffu geyre i. brakene.
 Sape & sapme i. verres.
 Toile i. lynde.
 Sewe i. Eldertre.

Papewort idem est secundum
 hibernicos.
 Morell petyt after fflaundres is
 called nasthath.
 Absinthum in frensch is called
 Aloygne & after flaundres
 Alsen.
 Comone malowes after fflaundres
 bee callyd pople. And Smalache
 is called Marche.
 Papewort in Irlond is called Dylle.

The book of Simples begins with a consideration of the virtues and uses of Ebulus or Walwort. The lily is held in high esteem for promoting suppuration, or, as he calls it, 'for ripening sores'. Gentian is used for the same purposes as at present, 'to abate the ache of the stomak . . . whoso useth it schall not have the Sciatyk, ne the Crampe, ne the cowghe, ne akynghe in the nekke, ne dropeseye, ne syghyinge, ne sorowe of the breste.' Then follows a disquisition on the salt fleum (eczema), which is treated by a mercurial ointment, the mercury being 'quenched with the spotell of a manne that is fastynghe'. The discussion of salt fleum is followed by the treatment of 'gutta rosacea' (acne of the face), for which a mercurial ointment is also recommended. 'And note wele after that this oyntment is anoynted one the face it schall not be wasschene ix dayes after, ffor trywly wasschynghe letteth the operacion of mercurye and then hathe the mercurye but lytyll effect or none. And this anoyntynghe may wele be renywed every other day. And when thou perceyvest that the skyne putteth out skalys it is the beste sygne of curacion.'

Grades in the medical profession. In speaking of Euphorbium Arderne clearly recognizes apothecaries as distinct from physicians, barbers, barber-surgeons, and surgeons, for he says 'Euforbium is a gumme that potecaryes sellen', and immediately before 'Agyryppa is ane oyntment that potecaryes sellen and it is whyte of coloure'. Palsy and the Falling Sickness are treated with caprifolium and castoreum.

Treatment of facial paralysis. Facial paralysis is to be cured by a variety of remedies; and it is clear that Arderne had seen several patients affected with it. He says that it is a species of cramp 'corrupting the form and the figure of the face. It turneth the mouth of the manne or of the womanne downe to the ere in the manner of a ffysche that is called a ffloundre'. . . . Of the prognosis 'Note wele yf the crokydnesse

of the mouth dure vi monthes it schall never be curyd . . . and if it come strongly it sleeth withinne iiii dayes & yf they gone therwith over iiii dayes they mowe askape'. In this connexion he quotes the case of 'The noble Duke Harry of Lancastre (who) hadde a knight with hyme at Agezire in Spayne the weche sodeynly was taken with the forseyd infirmite of the mouth so that his mouth was drawn bakward almoste behynde the ere in-so-moche that he myghte not speke . To the weche knyght the kyngys leche of Spayne made this cure . . . and so ofte he rehersyd uneto hyme this medicine (toasted bread dipped in vinegar, applied as hot as could be borne) that withinne a day naturall he was thereof delivered in certeyne (i. e. pro certo) and that lyghtly.' The interest of this case lies in the fact that 'the kyngys leche of Spain' seems to have been Arderne himself, for another manuscript (Sloane MS. 3548) gives the passage, 'Quidam miles nobilis Ducis Lancastriae apud Agezir in Hispania passus est subito torturam oris ita quod os ejus distractum fuit fere retro aurem nec loqui poterat. Ego, predictus Joh. Ardern, talem feci sibi curam &c.' Henry Plantagenet, cousin of Edward III, was created Duke of Lancaster in 1351. He was one of the original Knights of the Garter and a very mirror of chivalry. In 1343, when he was as yet Earl of Derby, he was sent to Spain and, with his fellow ambassador the Earl of Salisbury, saw service against the Moors at the siege of Algeçiras, where cannon were said to have been used for the first time. Arderne was aged 36 in 1343, and Alfonzo XI was King of Castile.

Use of charms. Having thus shown the effects of his newer learning Arderne almost immediately reverts to the Saxon part of his training. He gives with all gravity a 'charme for a woman that traveylethe with chylde'. 'Bynde this charme betwene here knees whanne sche travayleth with a pater noster & ave maria.'

He afterwards considers the virtues of Agrimony against the bites of serpents, hounds and wode (mad) men; of eupatorium, mullein, cinquefoil, daffodill, and sage.

Treatment of cases. Speaking of sage, he says :

'There was a wommane that sodeynly loste the feelynge & movynge of bothe armys in the nyghte. The weche I curyd with sauge wounden in paast & boyled in the ovene & afterward it was broken and putte in a galoune potte of erthe also hote as it was drawn out of the ovene. The weche potte I fylde with good staal ale & bonde the mouth above with a fayer lynnyn cloth & so I lete it stande al a day and reste. And by the morowe I took & . . . yaff it to the pacient & non other drynke but that. Thanne I anoynted the arme with mustard al abowte and wonde it in clothys and leyd his arme in his lappe, and thanne I took stonys hette in the feere and wonde them in lynnyn clothys & leyd hem to the handys that lakked here feelynge & mevyng & withinne iii days thorough continuyng & use of the hote stonys & the medycines puttyng too as it is afore seyde the handys & the armys began to rekovere & withinne a schort tyme after they were made hole. But nota that I hette a flour of ane house made with feere above therone & whanne it was wele hote I lete leye theruppon horsdunge in the mannere of a bedde & leyd clothes

above and made the wommane lye therinne uppone the sorere syde and helyd here wele with clothys & so sche laye al nyghte tyll the hete wente thorough the body and the armys & the spyrites revyved ayene . . . & so the womane with the helpe of god was curyd.'

Verbena he employs as an anaphrodisiac by local application; its value was clearly the result of suggestion. Plantago, the herb ivy, as a juice 'profiteth to almannere Arthretykys, i.e. gowtys'.

Epidemic sore throat (? *diphtheria*). Incidentally he alludes here to some great epidemic of the century—perhaps diphtheria—for he says, 'and note this diligently that in the sqwynancy (quinsy) & in alle the swellinges of the throte & the nekke & in all the lettynge of swolowyng as whanne the pacient may not swalowe neyther mete ne drynke & the pacient therof is ofte tymys dysposyd to the deeth withinne schort tyme & I have seye manye deyed therof withinne v dayes thorough stranglynge. To the weche it is to know that ther is nothyng more profytable therfore thane to use glysteryes of Malowys, mercurye (chenopodium?), branne & oyle or buttre, hony & Sal gemme or comone salt. This operacione draweth the wykkyd humours to the innere partyes that causeth the syknesse & so it helpeth the sqwynnancye.' The Black Death is apt to dominate our idea of epidemic illness in the fourteenth century, but there is no doubt that the pest was followed by many serious illnesses, for it left the people in an enfeebled state of health. It is perhaps noteworthy that in this account of the quinsy a^s Arderne saw it no mention is made of any rash, so that perhaps scarlatina may be excluded, for he was an accurate observer.

Treatment of cases. The virtues of scabious, fennel and solsequium or succory are extolled. A case is recited in which he cured a man upon a Christmas day whose leg was suddenly swollen out of measure from the knee to the ankle, 'and that was with rubore and huge brennyng so that he myght not stande.' The 'juice of solsequy medlyd' together with a little vinegar applied locally, and confinement to bed proved so successful that 'in certeyne or thane the kokk knew that same nyght folowyng the ache & the brennyng was staunchyd & the pacyent rested hyme wele and withinne iii dayes withoute any other medycyne he was parfytyl curyd, whereof manye hadde moche wondir'.

There is also the interesting case of 'a wommane faste by Doncastre that hadde a wombe (belly) so blowen that it passed the gretnesse of any wommane that was with chylde. The weche infirmyte was unknown & of good lechys sche was forsakene as for deede. The weche I curyd with clysteryes & with heme I voyded moche ventosyte.' 'The seed of pasnepes that bereth the yelow fflourys yf it ofte be etene or made in the manere of a lectuarye or of a suryp it is the beste remedye ayene the suffocacione i.e. stranglynge of the matrice secundum magistrum Johannem de Gadesdene.' The reference to John of Gaddesden (1280?–1361), author of the *Rosa Anglica*, is repeated in the treatise on the diseases of women. In this second instance, John of Gaddesden is said to recom-

mend 'the seed of an herb that is called passiantes and it hath rede floures & bereth seed lyke Saxifrage & it groweth in feeldy places & in Gardines' and it is useful 'ayenste the suffocacione of the matrice, after M. J. of Gadesdone'—suffocation of the matrice being hysteria in modern language.

Treatise on gout. The virtues of juniper causes Arderne to give a list of diuretics, and this leads him directly to a somewhat detailed account of gout. Diuretics, he says, 'profytene moste in alle the akynges of joyntes for they putten out the mater of the gowte by the uryne in certeyne (pro certo).' Their action is greatly aided by clysters. Gout comes of wines, especially if they be mixed, and from cold. It is best treated by local blood-letting, purging with a mild electuary, and diet. In certain cases it is useful to 'putte a ventose, with a manere that is called boxynge, of the nye partes and it shal be done per methatisme that is to sey it schalbe done withinne xxiiii ourys after the begynnyng of the sykness'. Later in the attack the patient may be purged with pillules 'de benedicta Harmodactilata' (Colchicum)

'or these pillules made of the maystrys of Salertitane the weche they yaff to the Erle Symond & Archybysschoppe of Romalde the weche avaylen ayene artitikys, podagre, sciatickys, selertes with oute perell they helpene the forseyd syknesse, Recipe hermodactilus, turbit, Agaricus ana ʒiiii. Cassie lignæ, gynger, mastichena macerat., Anyse, Ache, Saxifrage, brassica sem. Speragus, rosys, Gromell seed, Sal gemme ana ʒii. Aloes the quantyte of alle these, Scamonye sc. i. They schalbe made & medlyd with the juse of herbe yve or of ffenell yf thou lakke yve. Only the juse of herbe yve profiteth moche ayene the arthetikes. Every day a mane may yeve sykirly of thes pillules ix or xi late whane a mane goth to bedde. The conservynge also with the circumstaunsys that perteyne to the yevynge of the seyde pillules is that the wynde be sowth & esy & that the mone be not in non of thes sygnys that is to seye in Aries, in Tauro, nother in Capricorne. Also it is to be warre that the pacyent soowpe note in that nyght that he purposyth to take the seyde pillules & after that he hath resseuyd heme he may slepe ther-one, yf he wole, oone oure or more yf the pillules be note fressch to werke. And from the tyme that he feleth rumbelynge in the wombe (belly) he schall meve him from oo side to another & in no wyse slepe tyll he is purgyd.'

The prescription and advice is taken from Gilbertus Anglicus (Compendium, fol. 315 verso). The Earl Simon no doubt was Simon de Montfort, of whom the rhyme ran in Arderne's day :

Salve Symon Montis Fortis
Tocius flos milicie
Duras penas passus mortis
Protector gentis Anglie.

Sciatica. Arderne distinguished between a sciatica in its acute form, or sciatica passio, and sciatica that cometh of cold and gout in the bones called 'boneshave'. For cure of the boneshave he uses the oil of the yolks of eggs or the yolks of hard-boiled eggs, 'a good remedye & moche commendyd of the lechys of Salernen.' In this connexion he gives details

of a case of gouty concretion of the penis which he treated by causing it to slough off, 'ffor the weche cure I resseuwyd for my laboure xls'.

A cure for the gout. The early mediæval practitioner appears in the following sentences about the treatment of gout :

'A plastre of the grene levys of laury & Milfolye medlyd & stampyd togedyre with the grece of a masculyne hogge delivered ane Abbote of the gooute in the foot in oo nyght so that by the morne he myghte ryde & was hole.

A lyghte plastre for the goowte and a wondirfull in werkynge, the weche I have often provyd as wele to wommene as to mene, to cese the grete akyngys only with oone apposicione, bothe in the ffeet & in the knees & in other joyntys, but be-war that the pacyent perceyve it not, ne non other but rather kepe it counsell, but yf it be to thy sone or ellys to thy welbelovyd frend. I trowe forsoothe that it prevayle more toward the gowte than alle other medicines, and sounest wole abate the ache & it schalle lye v or vi dayes withoute removynge yf it may be so applyed. Thus it schalbe made. Recipe blak sope as moche as sufficeth & putte therto of the yelkys of eyrene as moche as the sope halff comprehendith & in a box or a dysche they schulle be strongly medlyd togydere tyll the sope hath lost his oune colour. And whanne it is sodene it schalbe streyght abrode with a slice or with thy thombe uppone softe herdys of fflex & leyd sadly uppone the place that aketh. Above thane that plastre ther schalbe putte a stryctorye of the whyte of ane eye & of whete mele & with a lynnene cloth wele wette therinne it schalbe putte uppone the seyde plastre & faste bounde therto & it schal note be remeyd to fore dywe tyme, but yf any convenyente cause lette it.'

Mustard. A full description of mustard and its uses is given, as might be expected from one who had practised for many years at Newark, since this town was then one of the most important centres of mustard growing in England.

Treatise on colic. The next treatise deals with colic in its various forms. It opens with a clear description of the passio iliaca or, as it would now be called, intestinal obstruction. Arderne says :

'Ilyca is a passionne in the smale guttys the weche ben callyd Ilya i.e. Smaltharmys & this passyone cometh with constypacione of the wombe (belly) & besy castyng (vomiting) & with huge akyng & sorowe, as though the guttes were boryd with a wymbyll (gimlet). And it hath ane indeferense from the Colyk, ffor in ilyk ther is more ache & more walowyng, now one the ryght side & now one the lefte syde, and sounere sleeth thorough his torment thane dooth the Colyke. And in ylyk the ache is moste from the navele upwarde & therefore it may be remedyed with medicines ordeynyd therfore yf the syknesse be not to moche growen. Also in ilica passio the mater that schulde passe out beneth foorth, other whyle it cometh out at the mowth, & other whyle ther falleth therof many cursyd syknessys, as yoksyng (hiccoughs), the crampe & coldnesse wastynge the extremytyes & stynkynge of all the body, and alle thes bene mortall yf they be with continuall vomyte, i.e. castyng. But ayenward yf it falle so that the mater that is takene by the mowth be made lesse & caste not, but that it goo doune to the nether partys it is a good tokene, & ellys it is note. This passionne of the ilyke cometh often tymes of a posteme of hote cause or of colde, or ellys of harde drestys (constipation) or

ellys of brokene humours goyinge aboute, or for falynge doune of the guttys into the purs of the testicyls, or of woormys or of febylnesse of the wytte.'

The *passio iliaca* is distinguished clearly from colic, one form of which is often associated with changes in the urine and so is due to a 'passion of the reynes'. But renal colic again may be distinguished from colic in the bowels. Arderne maintains that the pain of renal colic is fixed, and differs from Gordon, who, he says, teaches that 'the sorowe of the reynys is other whyle goyinge to & fro'. The treatment consists in giving clysters and in hot applications to the abdomen when they can be borne. Care must be taken in making these hot applications that they are not put over the region of the liver, 'lest that the livere be dyssolvdy thorough the hete of the medycine.'

A disquisition of clysters and their use is followed by an essay upon the causes and treatment of renal colic. In connexion with this subject Arderne contrasts the virtues of milk obtained from the cow, sheep, and goat.

The governaunce of nefretykes. A regimen for nephritics forms a separate tract, and is a common-sense instruction for the guidance of patients suffering from kidney disease. They are to lead an easy life; if they have passed a bad night they 'mowe slepe be the morne unto ix on the klokke'. Patients with renal disease should

'putte away ire, hyghly & moche besynesse & almanere thynges that longeth to the soule saff only joye. . . . They schulle forbere almanere metys that ben to grete of substaunse & viscous, as olde beeff that is myghtyly pooudryd & enharded with salt & also fressch porke but yf it lye in salt iiij dayes afore. . . . They mowe use grete wyne & the flessch of calvys that ben soowkynges & also of all ffowlys saff thoo that ben of the lakys & dichys (dykes?) . . . and squamous ffyssches, i.e. fyssch of the rivere, of the stony waterys & rennynges ryveres & not of the standynges waterys & they schulle eschywe almaner mete made of paast (pasties) & all bred that is dowgh bakene & all fatnesse. And they schulle use the reynes of the beeste other roste or sode. And in especiall he schall use a ffoowl that is callyd Cauda tremula or Wagstertte other fressch or salte or bakene withoute drynesse ffor & it be drye it is nought woorth. And note that the use of the powdir or of the flessch of the Wagstertte awayleth gretly to breke the stone in the bladdere.'

Arderne also distinguishes between inflammation of the kidney and 'a botch' or abscess of the kidney, and again between a botch of the kidney and a botch of the bladder. Botch of the bladder leads him to speak of strangury; and strangury of the chaudepisse or 'brennynges of the uryne in the yerde' with which he was perfectly familiar. The chaudepisse he treated with a mucilaginous injection.

Urinary disorders. Dysuria is classified under the headings of 'whanne the uryne is utterly denied', or suppression, which 'is a sygne of deeth withinne vii dayes'; and 'dyfficulthe i.e. hardnesse of pyssynges', or retention. M[ag.] W. de Hochesworth in cases of retention used the following

remedy: 'R Blak sope & stere it strongly in a boxe & after putte it in the schale of a walnote & leye it uppone the navele & bynde it wele therto & it schalle make a manne pysse lyghtly & anon in almanere of with-holdynge of uryne & this the seyde M. W. provyd of a kynge & ii byschoppys by-yende the see. Nota that this medicine schalbe made warme whane it is putte uppone the syke.' The symptoms of stone in the bladder are given graphically and clearly from observation, and they are distinguished from stone in the kidney.

The treatment of calculi impacted in the urethra. A stone impacted in the urethra

'causeth the pacient to suffre ryght grete peyne & intollerable i.e. unsufferable sorowe. To the weche avayleth hyghly Siringa, that is to seye ane instrument that schalbe made of sylvere or of latone in the manere as it is here figured (a straight rod like a probe with a knob at either end). & it may be made alwey in every good toune of Craftymene that maken pynnys for wommens hedys, or at the Goldsmythes & it behoveth to be lenger thane it is here figuryd but not gretter. With this instrument thou mayest putte away the stone in the bladdere & the sorowe schall anone cese & the uryne schall come oute. Many one have I so holpen . . . I have seye yonge mene & olde in the weche the stonys have bene as grete as a bene that have ben entryd into the yerde, that myghte nether come out by the yze (eye) of the yerde, ne be putte a-bakke ayene, but alwey abyded in the myddyll of the yerde by the weche mene I curyd lyghtly & sone with cuttynge in this manere. Ffurste I tooke the pacient & leyd hyme grovelyng & thanne I bonde the yerde one bothe sydys of the stone with lynnene swathelys so that the stone myghte nowher flee away and with a litell cuttynge uppone the stone with a launcette or with a rasour I hadde out the stone & after that I sowyd the utter skyne uppone the hole with ane nedle & threde & thane I leyde therone a strictorye of the whyte of ane eye (egg) medlyd with smal whete mele. And aftir the furste puttynge anon there-after I putte uppone the wounde of the poudir of Sangdragone [the resin of Calamus draco. It was used as an astringent] & of boly [Bulus armeniacus, a yellow earth containing oxide of iron] with cotone, & uppone thys poudre I wrappyd the yerde with smale lynnyn clothes that were wele usyd & small, the weche were furste anoyntyd in the forseyd strictorye & so I lete it be in thees by the space of iii dayes. And at another mevyng (dressing) I loosyd the thredys & the bondys & with the forseyd poudir that I leyde therone ayene & with unguentum album or arabicum withinne xv dayes I curyd it perfytylly. And lete hyme not be aferde though the uryne come not oute in iii or iiij dayes for he schalbe curyd wele ynough pro certo.'

Strangury. The next chapter deals with the treatment of strangury and incontinence of urine, and in this connexion he quotes the lines of Egidius, beginning: 'Ex vitio jecoris trahitur minatura cruoris,' &c., and ending, 'Et sanguis purus manat fomenta daturus.' The quotation is interesting because the Hunterian Library at Glasgow contains a commentary on this poem which is attributed to Arderne. I have had the manuscript copied. Its contents are uninteresting and not at all in the style of Arderne's other writings.

Hæmaturia. A treatise on hæmaturia follows in which a sudden

copious hæmorrhage is distinguished from blood coming out with corrupt matter. 'The more that the blood cometh from the ferther partys, the more it is medlyd with waterynesse. And the more that it cometh from the nygh partes with the lesse water it is medlyd.'

Gonorrhæa. 'The yerd of mane or the wykket i.e. vulva, of wommane yf they be brent with hete & grete swellynge withinne & with huge sorowe & prikkynge' are cured by injections, for 'of mannys yerde, & of wommans membre thorough the vice of the matrice, spryngen out many infirmytees.' The inflammation can also be taken down by the application of an ointment spread upon 'a small lynnyn cloth of the brede of vi ynychys,' kept in place in the case of a man by 'a lytyll bagge leste that the heed of the yerd hange doune and so to take the more swellynge. Euery day onys this werke schalbe renywed & namly ayenst evensonge.'

Ulceration of the penis. The whole treatise on ulceration of the penis is interesting. Cancer is distinguished from other forms of ulceration; phagedæna, too, was known, for directions are given 'to clean away dead flesch in the sore of a mannys yerd'. *Chaudepisse* was not uncommon, and there were botches which may have been soft sores, for they were clearly multiple, or they may have been the results of herpes where the vesicles had suppurated. In this chapter he quotes with approval the methods of 'Magister (Williaime) de Hokkesworth cirurgion nobillissimum', who 'curyd the Schereve of Wiltshyre when many good lechys hadde fayled'. I have tried in vain to find any other trace of Magister William de Hochesworth or Hokkesworth. Arderne had a high regard for him, and he may have been the master under whom he served his apprenticeship.

There is no evidence of syphilis nor description of any sore which might reasonably be taken for it.

Scabies. The itch is treated with litharge and quicksilver as an ointment mixed with orpiment and stavesacre, the mercury being mortified with the spittle of a fasting man.

Diseases of the male organs of generation. Following upon this short digression on scabies is a treatise on injuries and diseases of the scrotum and testicles. The injuries to these parts had arisen from a variety of causes as John Arderne saw them. 'I have knowe some that have geldyd heme-selff & taken away the stonys of the testyculys for evere. I have knowen also some men that thorough the bytynge of ane hounde the purse of the testicles hath ben almost al-to rentte . . . and that happed other whyle of hurtynge as a mane that lepyth uppone hys hors unwarly.' He also recognizes solid and fluid swellings, those that are painful and others that are painless. The whole essay is practical, original, and full of suggestions, showing that Arderne had seen several cases, and that such injuries and diseases were no less common then than they are at the present time.

Diseases of the eye. A treatise on diseases of the eye is introduced with a prefatory note on the value of Tutty, which is 'founden at the potekaryes

to selle & a pounce ther-of is worth xii d. The thennest platys of hem schulbe chosene to cure with the ezene & they comen from beyende the see. It is a grete medycine for the yzene.' Injuries to the eye 'of what manere that evere they ben, with stone or staff or harde stubbe or stalke or swerd or ony lyke' are best treated at once and by the use of white of egg. 'Some folyssch lechys and unkunynge whane they seene a mane smytene in the yze they taken wex & comyne poudryd & medlyd togedere & make ane emplastre & they laye it hote uppone the eye that is hurtte.'

Arderne's purging pellets. Most of the treatise, however, is taken from Lanfranc, so that it lacks originality and is a rather laboured composition, but it is remarkable in its anticipation of modern pharmacy, for Arderne describes some purging pellets whose composition he does not disclose. He says the patient 'schalbe purgyd ane oure after the sonne is go doune. Take of the pelletes withoute the weche I wolde not be, that is to seye xi, or xiii or xv, after the strengthe of the pacient & the pelletes schulbe of the gretnesse of oo [a] pese, & they schulbe yoven in rere eyrene (raw eggs) or wounde in obeleys (wafers) wette in wyne or ale or mede, & withoute chowyng they schulbe swolowyd doune.'

Of diseases of the eye Arderne recognizes simple inflammation, inflammation with rupture of the coat—traumatic rupture of the eyeball—web in the eye (cataract), blear eye, and watery eye. The blear eye he observes as occurring in crooked men as well as in others, so that he had evidently seen it in association with tuberculous diseases of the spine.

Treatise on fistulæ. The treatise on fistula printed in the Early English Text Society's publications follows the treatise on diseases of the eye, the two being separated by a prescription for making 'The drink of Antioch', which was used to cure all manner of fistulæ and cancers and 'yf yrene or thorne or splent of a staffe be in the fflesche'.

Another cure for scabies. Then follow the virtues of Parsley, of the Achs, and of Quicksilver. In connexion with the Aches (the old name for parsley) Arderne says: 'Wommene with chylde usynge Ache engendryth postemys & stynkynge bocchys in the body of the chylde. And therfore lechys forfenden wommene with chylde & norycys that kepen yonge soowkynge childerne from Ache leste that the childe be made unwyse or folyssch therthorough.' Quicksilver mortified and stirred well with the yolk of a raw egg may be rubbed into a woollen cloth. The cloth is then to be girded about the flanks, and is to be kept in place by a second cloth 'uppon hyme that is scabbyd & lowsy & it schall hele alle the scabbys & lyzs withoute any other thyng medlyd therwith; the weche I have provyd ane hundryd tymes & therwith have gote moche lucre, pro certo & that xx sol. for oo lyzste (dressing). And nota that such a lyzste schalbe borne uppone a mane xl dayes or a monthe at the leeste.'

Next comes a formula for making an aqua vitæ, a decoction of herbs, and not as we understand the term, a spirit. This is followed by directions

for making an Ol. Rosat, written in French, and others for the manufacture of Nervale in the same language.

Veterinary knowledge. The receipts are varied with a little veterinary medicine. There is the following prescription, for instance: 'And yf thou wolte make ane hors resseyve whatsoevere thou yeve hyme for medycyne; take thy fyngres and streyne wele bothe sydes of his mowth & withoute dowte he schall chewe & ete whatsoevere is yoven hyme.' There is also a second veterinary receipt: 'For ane hors that is yvele nayled. Take mowsere (? Forget-me-not (the *Myosotis palustris*), or perhaps the *Hieracium Pilosella*) & stampe it in a mortar & yeve hyme the juse ther-of to drynke & remeve the foot that is so cloyed & stoppe wele the akyng place, and withoute dowte thou mayst ryde uppone thyne hors forth-with-all.'

Treatise on the treatment of wounds. There is good practical discourse on the dressing of wounds written energetically and to show that wounds were best left alone and dressed as seldom as possible and only with the simplest applications. To support his action he quotes 'ypocras in a book that he calleth Afforismus'.

The instrumental treatment of retention of urine. The next treatise deals with retention of urine and its relief by

'a Sirynge. A Syrynge is a instrument made of silvere longe & small and holowgh in the myddell in the manere of a clysterye to the weche ther schalbe bounde a bladder with the seyde oyle round abowte at the gretter heed and the smallere heed that is tofore schalbe putte into the (e)ye of the mannes yerd and the bladder (at the other end) schalbe pressed with the hande betwene the fyngrys and the oyle schall entre in or other lyquour. And nota that this instrument schall not have many holys as other haven tofore, but only oone hole for the medycyne schalbe hylde in the bettere with oone hole thanne with manye pro certo. And whane thou schalt hylde ony-thinge into the bladder asayde the syringe hough moche it sufficeth, thanne the leche with hys leffte hande schall streyne sadly the heed of the yerde betwene his fyngres une-to the syringe that the oyle or the other medicine hylde in go not out by the (e)ye of the yerd.'

It is interesting to notice that Arderne had no conception of drawing urine out of the bladder; his object being to force a passage along the urethra by which the water might afterwards escape.

Of constipation. A short treatise on constipation is designed 'for tho(se) that ben kept delycyously, the weche alwey ben moste constypatte. It is a lyght medycine & a laxatyff and ther is no perell in the recepcione ne in the usynge ther-of, for it enfebleth not the body ne consumeth.' It consisted of elder flowers dried in the sun and mixed 'i spon full in his potage & yf he use it, that is constipatte, it maketh hyme laxe per certo. And the same dooeth mynte dryed & made in poudere in the same manere as it is aforseyd yf it be usyd and yf they be bothe medlyd togedere the medicine schalbe the more expertere in werkyng.'

Of the classification of medicines. The essay on the classification of

medicines is mostly formal and contains little of interest. It shows incidentally that Arderne had a high opinion of vinegar both as an external application and on account of its dietetic value. The remarks on simple medicines, he says, 'ben drawn out of ane extractte booke that is callyd liber virtutum, the weche begynneth thus Cogitanti mihi de medicinarum simplicium virtutibus, &c.'

The virtues of rue. Rue was a valuable remedy. It 'withstandyth and heleth hem that have ete or dronken venyme. Ther was a mane that was enfectte thorough the desyre & etyng of a lamprey, wherof his face & his yzene were alto swollen that it was wonder to see, the weche was curyd with the decoccione of wyne & rywe & withinne ii dayes thorough the drynkyng therof he was wele rekeveryd.'

Of rabies. In connexion with the virtues of rue Arderne gives the following account of hydrophobia. He says :

'The bytyng of a wood (mad) dogge is more venemous & perlous thane it is of a serpente, ffor the venyme of a wood dogge ys hydd often tymes by the hole yere togydere & other whyle by the ii yere, & after some auctours it wole endure vii yere or it sle a man. And note wheyther it be longe tyme hydd or schorte or that it slee, ther comene tofore to the pacient thes tokenys medlyng & chaungyng of wytte & resone & abhominacione & lothsomnesse of cold water that is clene & pure. And whane suche sygnys fallen to him that is byten of a wood hound schall unnethe or ellys nevere ascape it.

The tokenys of a wood dogge ben these; the furste is he knoweth not his lord ne his mayster & he falleth into a voyd goyinge allone with boowyng of his heed & hangyng of the erys as other wyse thanne he hadde hem in his helthe & the yene of him ben rede & the fome cometh out at the mowth & he wole berke at his ounne schadowe & he hath ane hos berkyng, & other houndes fleene from hym & berken towardys hym. And yf a schyvere of breed be folden or wette in the bytyng of the sore & yoven a dogge to ete, yf that he ete it, it is a tokene that the dogge is not wood, for and the dogge be wood that other dogge that the breed is yoven to wole not ete it, but that he be over moche hungrily, and yf he denye to ete the seyde breed out-take the condicione aforseyd thane is the dogge wood.

If the bytyng of the wood dogge be in the ryghte wey of curacione the venemous mater schall furste be drawn out une-to the uttere party by the place of the bytyng, after the holsome counsell of Johannem Damascenum & after Gordone & alle other gode auctors. The weche seyne that ther schalbe no blood letene, ne laxatyff medicyne yoven, ne clysterye, ne bath, ne non other tyll that it be passyd iii dayes at the leeste, ffor and it be done tofore it schall drawe the venyme moche the souner to the innere parties. In the furste there schalbe putte a ventosynge with the manere of a garcyng (scarification) or boxyng uppon the place of the bytyng, and the waterlechys, yf they mowe be hadde, ben profitable ther-fore. And yf they mowe not be hadde, thane schall it be boxed deepe abowte the place of the bytyng that the blood may come out moche & lete not the sore be close, and yf it be close or strayt putte ther-one a ruptorye (i.e. Fretere) of qwyklyme & soft sope, or ellys make a chafyng with hote yrene & after that it falleth to the skyne putte ther-one of the brent ruptorye & after that putte rawgh laard of a swyne in the wounde with comone oyle in the weche schalbe furste boyled

Garleke or oynyouns or leeke, rywe or fenell seed stamped, Solseque or the roote of Affodylle, Scabious or the roote of lylle. Astrologia rotunda, or linaria, i.e. flex, or pimperlle, bayes of laures, Genciane or southernwode. Alle these togedere or sengle by hemselffe vaylene ayenst the bytynge of woode dogges & other also that ben not woode.

And the place of the bytynge schalbe holden opene as longe as it may profytably that is to seye flyfty dayes & with every medycyne ther schalbe putte brent saltte, the weche awayleth moche by it-selffe & with other.

After the iii^{de} day yf strengthe & age wole suffre it ther schalbe made blodletyng, per metatetisme, that is to sey of the same partye there that the bytynge is & ther schalbe made Clysteryes in the weche schalbe putte yerapigra and in the ende ther schalbe made a bath and the pacyent schall use Oynouns, garlek and rywe. Also hote yrene schalbe qweynt out of oo water into another & ii or iii or more, every day he schall drynke of that water. Lyghtere medicines ther ben in tyme of nede & lasse of pris and moste to the use of poure mene, the weche lyghtly mowe be founde as ayenst the bytynge of a wood dogge or other, leeke or porrette chewyd in the mowth & emplastryd uppone the sore awayleth moche. Also for the same stampe the reed netle with salte & ley it therone, it heleth wele. And the same doth the levys of leekes. Also for almanere of bytyngys yeve hyme the poudre of the roote of Turmentyll to drynke with wyne & he schalbe hole.'

There are also remedies for the biting of a toad and against the stroke of a scorpion as well as against the stroke of a serpent. Then there is the 'curacion of the byting of a wood man', or, which was equally serious in the eyes of the mediæval surgeons, of a man who was not mad but was fasting. In this connexion of the danger of a fasting man's bite it would be interesting to speculate whether pyorrhœa alveolaris was of frequent occurrence in the Middle Ages, so that a bite was equivalent to inoculation with pyogenic organisms.

Of the diseases of women. Next comes a treatise on pruritus vulvæ and uterine cancer. The pruritus is treated by local application of a decoction of celandine, whilst cancer in the matrice may not be healed any more than cancer of the tywell (rectum).

'I have seyne wommene havynge the cankre in here membre whereof the lypes of the membre remaynedene holy together & withinne the membre there were ballyd knottes hard & flayne stoppyng the hole of the membre wherthorough they peryschedere.'

The powder of gall is useful in the treatment of cancer, and licium, that is to say, the juice of woodbine availeth much.

'And this I provyd in a worthy mane that hadde in his legge a grete pusschy sore, in the weche curacione alle medicines fayleden & with that he was sone curyd ffor at the furste tyme that it was putte one the sore it dryed & putte away the stynkyng therof & all the yvyll so that withinne a monthe he was fully curyd.'

On hiccough. The 'yoksyng', or hiccough, is as though it were a cramp of the stomach that is replete or void. It is also caused by the drinking of wine after eating pepper, but it may be of very serious import,

for 'reednesse of yzene in yexynge & after vomyte (i.e. Castynge) is ane yvyll sygne after ypocras, suche manere reednesse of yene sygnyfyeth a posteme in the stomake or in the brayne, but moste in the brayne', that is to say, an apoplexy. Under the heading of hiccough the treatise deals with various disorders of the stomach, but not in a very illuminating manner.

On the extraction of teeth. The short essay on the extraction of teeth is interesting from many points of view. One prescription runs :

'To drawe out a tooth that is akyng or rotyng. The tooth the weche thou wolte putte out schalbe rubbyd with the gumme of yvy & anon he schall falle out, or ley the gumme therto but bewar that it towche non other tooth. Also the same dooeth the roote of Simphonici i.e. henbane. It schall furste be sothen in vinegre & afterwarde stamped & leyd slyly to the tooth.'

These receipts are evidently part of the Saxon training in medicine. Anon comes knowledge gained by travel.

'Also for the same. Take the ffroggyss that be founden beyonde the see, the weche ben callyd Chaunte royll & syngen in the toppe of the wylowys that growen by the ryver sydes & seeth hem in oyle or in buttere & anoynte the teeth withall & in certayne they schulle falle out, or yf the tooth be towched with the blood of hem he schall falle anon, and note wele, they ben not venemous for the ffrensschemene etene heme.'

Of indigestion. Next comes a table of the weights and measures in ordinary use in medicine, and this is followed by a treatise on dyspepsia introduced by an account of the virtues of maces. Arderne distinguishes in this treatise between 'colica passio the weche is openly callyd Mal de fflanke' colic and iliaca passio.

Various surgical cases. There is a prescription for swelling of the arm after blood-letting and others 'ayenste akyng and swellynge of prikkyng of a senyw in the arm of bloodletynge or in any other membre'.

A never-dying light. Then comes a little bit of chemistry :

'To make a continuall lyght withoute fyre alwey schynynge & duryng in the nyghte for evermore. Take a grete quantyte of wormys that schynen anyghte tyme in the ffeeldys & putte heme in a vessell of glasse & the mowth wele stoped & putte hem in a place ther that they mowe sone putryfy (i.e. rote) or in a Dungehull by the space of xvi dayes or more. Afterward take the lyquour that thou schalt fynde in the vessell & putte it in a vyoll of glasse & putte therto alsomoche of qwyksilver as ther is of the lyquour & hange that vyole in a derke place & it schall yeve lyght al-abowte per certo.'

A sleeping draught. There are also

'Pellettes to provoke slepe. Take Amidi ʒii ; saffrone ʒiii ; opium ʒi. Make these with rosewater in manere of pellettes & yeve heme to ete and whoso-eve take hem schall slepe in certeyne. And he schalbe reysed with vinegre & with tho thynges that maken mene to snese and afterward ther schalbe yoven hyme a comfortatyff for the brayne as ben Castorye or Notememugges.'

On fevers. Fever he treats simply with charms, that is to say with placebos to keep up the spirits of the patient until the fever subsides naturally. Thus for

'every ffevere wryte thys charme in the ryght hande withinneforth with ynke. *In n. p. & f. & s. σ. a. (In nomine patris et filii et spiritus sancti. Amen.) One alpha, one oo agnus, one serpens on vitulus.* Afterward he schall wassche hys hande in holy water & sey iii pater nosters, Ave, & Crede & anon after he schall drynke the water in the weche he wessche his hande, and this he schall do iii dayes, & yf he have feyth therone he schalbe delivered. But yf it have holden hyme vii dayes or vii wokes tofore that he have this charme thane it behoveth hyme furst to be schryven & after resseyve the medicine. Also to the ffevere terciane, wryte in iii obleyes (wafers) that is to seye in the furste schalbe wryte *increatedus pater, increatus filius, increatus spiritus sanctus.* In the second wryte *immensus pater, immensus filius, immensus spiritus sanctus.* In the iii^{de} wryte *Eternus pater, eternus filius, eternus spiritus sanctus.* These iii obleys the syke schal ete tofore the accesssione erly be the morowe, but furste he schall seye his pater noster and be confessyd yf that he be of age and thane he schalle ete the iii obleys in iii dayes as it is aforseyde. And note trywly that yf the terciane be not endyd withinne xii dayes after that it taketh a mane, it endureth longe tyme. Ayenste the quartane as some mene seyne yf the chyne of the pacient be rubbyd ayenste the fyre with peper & oyle medlyd togydere with Euforbium thou schalte knowe wele that it wole turne sone the quartane into a continuall fevere.'

The treatment of fevers is followed by paragraphs on the treatment of headache, quartan ague, haematuria, and dysentery.

'Ayenste dyssenterye the pacient schall holde his ryght ffoot in cold water upp to the testiculys & ferdermore he schall drynke with ii pypes of the melke of a koow of oo colour that is nywe molkene & of reed wyne that is called respyed or rayspeys furste of that oone that the weyne is inne & after of the other pype that the mylke is inne. & it schalbe doone at oo tyme.' Also 'whoso desireth to have helpe of the wombe withoute akyng & hurlyng (borborygmi) lete him drynk often the juse of rywe, the oyle of rywe throwen in by a Clysterye ceseth the ache of the colike.'

On diseases of women, especially hysteria. A treatise on diseases of women deals with complete prolapse of the uterus; on falling of the matrice and its treatment; on strangling of the matrice (hysteria). Against difficult birth; to purge the matrice after childbirth, and to bring out a child that is dead. The causes of menorrhagia and its treatment by cupping, never by cautery. Menstruation and its uses. The most interesting is the article on strangling of the matrice or hysteria as Arderne saw it in the fourteenth century. He says:

'Strangelynge of the matrice is a passyone that cometh of assendynge of the matrice up to the mydreeffe & causeth swonyng & foryetyng of wytt & mevyng in all the body, and this passion falleth as wele only in maydenys that ben corrupt as in other wommene, and it cometh of venemous humours beyng in the matrice from the weche assendeth up vaporious hete into the brayne & causeth derknesse & grenesse of the yene & hedache, and the wommane that suffereth this passyone feleth noyous fume assendynge up to the uppere partyes & sche compresseth here handes

uppone here bely and holdeth here knees togydere & yf sche [be] called by here propre name sche understandeth it wele but sche may not answeere, & sche lyth often tyme as though sche were deed and after the passione is cesyd sche wole reporte all that was done and seyde. It is to be understande that a womane beeing in this passyone behoveth furste to have stronge rubbynge in the extremityffes that is to seye in the ffeet & in the handes with salt and vinegre. Thane schall ther be made byndyng in the hypes provokynge out the sorowe, thane ferdermore ther schalbe putt to the nosederles Asafetida or a lynnene cloth brent or wollen cloth is bettere or hennes federes or mannes heere brend & suche other that engendren stynkyng savour. ferthermore thane schall ther be made sternitacions that is to seye ssnesynge with mustard & peper.'

He quotes Gordon on the cause of hysteria, and John of Gaddesden as an authority on its treatment.

A case of cancer of the male breast. Then follows the case of a priest who had an ulceration of the breast. Arderne says :

' To a preest of Colstone faste by Bynghuame (? Colston Bassett in Notts) ther felle a sore in the ryghte pappe withinne the skyne uppone the heed of the pappe as it were a litill knotte & in manere of a pese with ychhyng & so the forseyd knotte be contynywaunse grew foorth tyll it was of the gretnesse of ane henne egge & that it came to the foorme & lyknesse of a topp. And in the begynnyng of the mone the akyng therof begane to assayle hyme by the space of ii dayes or iii or more. The colour of this sore was lyvyd medlyd with rednesse & waterynesse & hard in felyng & whane ii yere were passyd he was tawghte of a lady to leye ane emplastre therto & to drynke of the drynke of Antioche by longe tyme and whane he perceyved that the forseyd medicines preyayled hyme mowgth he wente unto the towne of Notynghuame to be leten blood & whane the barbour perceyved the forseyd knotte he asked of hyme whether that he wolde be holpen therof & tolde hyme that he hadde a cure therfore & coowde hele hyme therof. The preest seyde he wolde fayne be holpen but nevertheless he seyde to him he wolde aske counsell yf it myghte be done as he seyde une-to hyme. And in the same towne ther was a wyse sirurgyane of the weche the seyde preest hadde wetynge & wente to hyme to aske counsell yf that he were curable or if that he myghte suffre ony kuttyng or corrosyne or ony suche other medicines. And the seyde leche warned him that he schulde in no manere wyse putte no corrosyne ne non other violent medicines ne lete no kyttynges come ther-ny ffor yf he dyde he promysed that it wolde bryng hyme to the deeth withowten ony rekevere.'

The wise surgeon was undoubtedly Arderne himself, and the priest had a scirrhus of the breast. The advice, therefore, was certainly worth the fee paid.

Directions are given for the treatment of 'ane infeccione that is called Erpes that lyth in lengthe as it were ane impetuous serpent', and then comes a case of cancer in the penis of a parson.

A case of epithelioma of the scrotum. It is told that

' in the yerde of a persone ther felle a sodeyne ychhyng in-so-moche that he koowde not abstene hyme from rubbyng & whane he hadde so rubbyd it withinne a whyle after ther grywe in the tywell betwene the skyne of

the yerd the manere of a werte & of the gretnesse of a strawberye & of the same lyknesse the weche alwey gryw foorth & afterward withinne space of tyme it took the skyne withowten & alwey it was spredynge in-so-moche that it lette hyme to pysse, wherfore he submytted him to the curys of expertte leches, of the weche ther was oone that purposed him in the furste to have had away the superfluite of the seyde sore and putte ther-to many corrosynes to frenen it, and, as it was seyde une-to mee, it was the poudre of alume de plume the weche schulde beste have wasted it. But not for that, after that halff yere was passed it begane to grow ayene in the manere aforseyd & more violentere. Thane sowghte he help and asked counsel of another leche & took his cure to have wasted away the seyde matere, but it was alwey in the formere partye & avayled not and alwey it grywe bakward more & more ayenste the yerd tyll the knotte was altogydere inward & the skyne of the yerde was alwey turnyd toward the body as it dooth in cankre. Nevertheles after longe tyme the mayster (Surgeon) forsook the persone & wolde no more cure do to hyme. Then came therto the seyde persone another leche & dyde his cure to hyme & by the space of tyme he putte one the sore emplastris & poudrys. And one a tyme he putte ther-one a poudre & whane he schulde afterward remeve (redress) the yerd the poudre hadde fretene a veyne so deepe that the blood flowed out in so grete quantyte that he myghte unnethe restreyne it & not-withstandynge though it were restreyned at that tyme yet yt fylle so to hyme after that out of the yerd ranne moche superfluous blood often & wolde not lightly cese. And whane the mayster all a yere hadde done his curys to the seyde persone he lefte hyme lyinge upponne his coowche & one a tyme he efly staaled away from hyme.

And after tyme he was gone the blood upponne a day brak out of the yerd in moche quantyte. Thane was I required & came to hyme but er thane I came the blood was restreyned be it-selff thorough congeleyng and he was not so hardy to meve hyme-selff ony-thinge lest that the blood brake out. And whane I hadde seyde his infirmite & spokene with hyme I assayed by a monthe hough the ministracione & werke of Sirurgerye wolde falle une-to hyme. And note that the yerd of him was of the lyknesse as it is afore foormyd (a sketch is given in the original) with gret duresse in the sore party & the uryne came out at v holes & otherwhyle moo & note in the ende of the yerde but behynde the knotte as it hadde be in the myddyll therof it wente out in every partye. To the wounde ther that the swellynge of blood was I putte a stryctorye made of the juse of walwort & arthemysye & of the juse of netle & ache & of Absinthium, of Alum, of the whyte of ane ey & of hony ana, & these schulbe tempriyd with barlymele. And I made not this for a notable cure une-to hyme but for-as-moche as I hadde perceyved that this emplastre restreyned wele blood in diverse places of the body that it schulde prevayle hyme also wele ynough as for staunchynge of blood. And to the superfluite of the formere parte of the yerd I putte this poudre Recipe, Aurypigmentum i.e. orpiment, Peper, qwyklyme, barly mele, hony that is callyd rawgh, & stronge vinegre ana. Medle alle these togydere & brenne hem in a nywe erthene pottle tyll ther be made poudre therof. And whane this poudre hadde ii [twice] be putte therto, the ende of the yerd schewed a lityll, & after the iii^{de} tyme the poudre was therto, the sore after-folowynge schewyd bettere & spredde itselff abrode in manere of a coronall of a spere as mene justene with at a Turnement & therwith it hadde pappys lyke to the pappys of ane hoownd engrosed withinne-forth, the weche pappys with the other superfluities I destroyed with the

seyde pouder, the weche nevere-to-fore myghte be putt away with ony medicines & after this with kyttyng in a place of the sore there that the pacient myghte suffre it, I made the uryne to go owt only at oone hole, thane abowte the uppere part of the yerd & abowte the place there the blood flowed out were growynge like to the burbolys weche grown in the lyppes of kyzne withinneforth that were full of blood, the weche the seyd pouder myghte not wele putt away. Thanne I putte ther-one qweynt (quenched) pouder of Arsenyke the weche furste was medlyd with the melke of a womane & with barly mele & abowte evesong tyme I leyd it ther-one, thorough the weche he suffryd gret grevaunse all nyghte & above uppone the pouder I putte the emplastre of the strictorye aforseyd with herdys. And by the morowe I remeved the seyd emplastre and putte uppone the yerd a thenne leeske of larde & leyd another emplastre theruppone. ffor note that laárd after the puttyng to of Arsenyk or of any other corrosyne poudir looseth best the ded flessch from the qwyke & in the wounde it engendreth mater & maketh it large. . . . And as the seyd persone tolde me, but nevertheles he provyd it not, that the pouder of the ffederes of ane hene brend streyned so the flowynge blood of the yerd so that it be bounden above & not remevyd it schall nomore renne tyll that the wounde there the blood came out be helyd & with this pouder was putte the heeres of an hare.

fferdermore so every day I putte one the laard till that all the ded flessch was departed from the qwyke, and in the mevyng that was to be remevyd at that tyme & with the operacione afore done the yvyll of the yerd was almoste clensyd from all superfluite saff a litill one that oo parte ayenste the kodd of the testiculys.

Thane I putte pouder in the place that was so clensyd to drye upp the moyste mater & to regendre good flessch the weche dyde him gret benefice of goodnesse, that is to seye Boly armenici, Sanguis draconis, Galles, Colofonye, Olibanum & mastyke.

And note that whan alle these forseyd curys were done ther fyll non inflacione ne swellynge to the yerd neyther undyscreeet ne sodeyne, nevertheles all the yerd was consumed saff the space of a ffyngere tofore pectinene (anus), wher yet now the Cankere had not sesed ne taken no ferder, the weche was a sygne of curabylyte, ffor in what manne that evere it be yf the Cankere take the pectinene i.e. harshole, he is uncurable.

Afterward I was in wyllynge to have don hyme a cure in clensynge of the sayd partyes ayenste the testiculys the weche were not yet clensyd & he alwey denyed it & seyde he myghte nomore suffre so hard cure. And afterward ther came to hyme a straunge leche & made him-selffi wyse & seyde he wolde clene cure him & at the requisicione of the persone he hadde a syghte of his infirmyte whyle I was there presente & he seyde that he was curable ynowgh & ferdermore, he seyde, that he myghte be curyd withouten ony grevaunse, & the superfluite the weche I hadde furst remevyd as by mortyfyinge he seyde that it mighte be revixed & brought ayene to the furste staat. This promysse plesyd the persone & obeyed alwey the cure of the seyde leche. The weche, as semyd me was unconvenient & also impossible wherfore I ayenseyde hyme that suche a cure myghte not be done. Nevertheles whane the persone hadde consentyd une-to hyme, I forsook all the werk & lete heme bothe allone with-all. Another cure he behyght hyme also, but nevertheles that that he promysed to revixe ayene he myghte neyther revyxne ne remeve, but whane he hadde putte to his cure of remevynge it wrowghte & freete so in the sore that the tywell & the testyculis of the persone were hugely swollen

in-so-moche that for angwyssch & akyng he was despeyryd of his lyffe, and so the leche went deefly his wey & lefte the persone incurable.

I have quoted this case at length because it is told so graphically. It illustrates the methods of treating an epithelioma, the fear of hæmorrhage when ligatures were rarely used and styptics were unreliable. It tells, too, of the slippery ways of leeches and of their itinerant character. It shows Arderne as an uncompromising speaker of the truth, and there is a delightful little sidelight on his character in the comment upon the parson's statement that the burnt feathers of a fowl were good to staunch blood, for he says he 'tolde me, but nevertheless he proved it not'.

Another case is given in detail and deals with the treatment of a normal or callous ulcer of the leg.

A case of balanoposthitis. He also narrated a case of gonorrhœa with soft sores and acute inflammation, and 'of a ledy the seyd mane was tawghte to putte therto ane emplastre made of the leekys with the rootes sodene & with grece medlyd togydere'. The application made him worse, so he came to Arderne who circumcised him, for he says 'that that hyng under the yerd was putte uppone a table & with a rasour I kytte it away & the corrupt blood I lete wele gone owt'. There is also an elaborate treatment of paraphimosis which closes the treatise on diseases of the male generative organs.

A case of poisoned foot. The treatise on fistulæ of the fingers (which is already published) is supplemented in the Cambridge MS. at Emmanuel College with the case of

'a mayden the weche, as sche seyde, was smeten of another child with ane hamer uppone the nayl of the grete too i.e. thombeltoo. And after tyme that sche hadde gone therwith awhyle, under the nayl of the too ther came out whyte lyquyd fylthe & the nayle was almoste departed from the flessch.'

It was treated with powders and afterwards burnt under the nail 'with a small uryne made therfore'. She was cured.

A case of hysteria in the male. There

'was also a preest, as it was tolde me of a mane, the weche lay in his bedde in a mornynge, wakyng, & as he lay he felte a thyng goyinge uppone hym & he streyghte out his hand faste by hym & kawghte a ratte the weche he hyld so straye & so sore that he pyssed doune uppone his naked breste, & whane the preest sawgh that it was a ratt he caste it a-wey from hym & wyped his breste with a cloth, but not for thanne afterward it swall & dyde hym grete grevaunse with-inne-foorth, so that the seyd preest assayed therfore medicines of many diverse leches, but they myghte ryght nowght avaylen hym.

Nevertheles thorough his owne mocione he made hym-selffe to be lete blood of bothe armys & bledde in gret quantyte, & whane he hadde so done, anon of the forseyd infirmyte he was hole, & all the yvyll away vanyssched.

But nevertheles yf the forseyd preest in the begynnynge whane the uryne touched hym, hadde with his owne uryne wasschene & rubbyd hymeselffe wele, thou schalt knowe wele that ther schulde non yvyll have ronne in-to the body of the forseyd uryne as it hath be provyd.'

It is clear from this case that neurasthenia occurred in the fourteenth century.

A case of caput succedaneum. Then follows an interesting case of caput succedaneum which suppurated and was cured although 'the sculle apperyd naked & loos in the lengthe of a fyngere'.

A case of traumatic tetanus. There was also

'a gardinere whyle that he wrowghte in the vynes kytte his owne hande with ane hooke uppone a ffryday after the fieste of Seynt Thomas of Caunterbury in somere so that the thoombe was altogydere departyd from the hande saff only in the juncture that was joyned to the hande, and he myghte boowe bakward the thoombe to his arme & ther stremyd out therof moche blood.

And so touchyng to the cure. The thoombe was furst reduced in-to his furste ordre & sowyd & the blood was restreyned with the reed pouder of launfrankes & with the heerys of ane hare and it was not remeyyd une-to the iii^d day, and in the iii^de day whan it was remeyyd ther apperyd no blood. Thanne was ther putte therto tho medicines that engendren blood, every day ones repeyrynge the wounde, & tho it begane to purge it-selffe and to gadere mater. And in the iii^{tt}e nyght after the blood brak out abowte mydnyght in the wheyghte of ii poundes. And whane the blood was restreyned the wounde was repeyred frome day to day as it was furste.

Also in the xithe nyght abowte the forseyd oure the blood brake owt ayene in more quantyte thane it dyde afore tyme, nevertheles the blood was staunched, & by the morne the pacient was so taken with the crampe in the chekes & in the arme that he myghte resseyve no mete in-to his mowth ne neyther opene the mowth & so vexyng the pacient in the xv day the blood brake out ayene & in the xviii day the blood brak owt ayene owt of mesure & alwey the crampe endured forth & in the xx day he deyde.'

Evidently a case of recurrent secondary hæmorrhage with subacute tetanus.

Arderne had many friends amongst the clergy, for the next case was 'tolde me of a ffirere menour ther was a ryche mane that hadde ane yvyll in the legge that came uppone hyme in the manere of a blake pussch . . . but he was not curyd therof for he was uncurable.'

A case of a dermoid cyst on the scalp. The manuscript ends with an account of a dermoid cyst which is thus described :

'Sir Thomas Newmache hadde a sone that hadde a wenne ryght uppone the opene of the heed before & he was borne withall but it was furste no more thane a bene & it wex more & more so that by the child was v wynter of age the wenne [was] as moche as the yelke of ane ey and as water & heer gryw therone, but not so thykke allnynges as in other places of the heed ; so befylle it that a mayster came & sawgh it and seyde he wolde do his crafte therto, but he wolde not undertake the chyldes lyff, ffurste he leyde an oynoun rosted therto, and under it leyde pouder for to breke it with, and so it dyde, and whanne it was brokene ther came out thenne wose & whyte, and he leyd therto every day not but laard & a pouder otherwhyle to clense it with, & so it dyde ; whane the wounde was wele enlarged aboven, thane fonde they withinne the wenne a loke of heere

al-so-longe as a mannes fynger, and were as gret, lyinge wrythed one a lumpe and whane it was removyd owt it was rootfast growynge, and therefore have I wreten it as for a wondir that suche a loke of heere schulde growe under another skyne; and the skyne of the wenne bare heer nevere the lattere.'

A commentary on Ægidius Carboliensis. Thus ends the accepted works of John Arderne. A manuscript exists in the University Museum at Glasgow which is headed 'Aegidii Carboliensis Tractatus Metricus De Urinis. Master John Arderne Commentary in English on the above treatise De Urinis.' The manuscript is described in the catalogue as 'Vellum $7\frac{3}{4} \times 5\frac{1}{4}$; ff. 68 originally ff. 69 (or ff. 70), well written in a plain hand in single cols. of about twenty-nine lines each. $5\frac{5}{8} - 5\frac{1}{4} \times 3\frac{1}{2}$, margined with brown crayon, not ruled; signatures, traces only left, practically all gnawed off (by beetles) where not cropped, catchwords, foliation modern (in pencil); rubrics, rubricated initials and ¶¶, running titles, initials touched with vermilion, marginalia much cropped, writing retouched in places, fol. sec. black. Early Cent. xv.'

Binding. Thin beech boards, covered quarter calf, coarse dark blue paper sides, Early Cent. xviii.

Collation. Two paper fly-leaves (i²) both attached 1⁸-3⁸, 4⁷⁽⁸⁾, 5⁸-7⁸, 8⁷⁽⁸⁾, 9⁸. Two paper fly-leaves (II²) ii. 2 attached. 4, 6 is cut out (probably to remove a miswritten leaf, as the text is continuous). 8, 3 is a half-sheet (probably so originally).

The manuscript begins: 'I. H. S. Michael, Ego Magister Johannes Arderonn (*sic*) hoc opusculum composui de iudiciis vrinarum per colores et contenta secundum yndicium Egidij et ypocratis, Walterij. Gilis. Gilberti. Gordoni. Johannis de sancto Amando. Ysaac. Auicenne; theophili. Galyeni. Galterii. et tholomeij in medicinam, et medicum domini regis illustrissimi principis henrici quarti cujus anime propicietur deus. Amen.'

I do not think this work can be properly assigned to John Arderne, although the name of Arderonn might well be a copyist's error. The reference to the physician of King Henry IV, who was already dead, shows that it must have been written after the year 1413, and Arderne was born in 1307. The whole style of the treatise, too, is different from the other writings of Arderne. It is a dull commentary with none of the lighter touches or details of cases which are so characteristic of Arderne's other writings. The treatise deals with black urine, with blue or livid urine, white urine, yellow or glaucous urine, milky urine, Karapos or ropy purulent urine (in diseases of the liver 'yf a water apere ffyrste white, and than yelwe, than mylky and the laste be karapos it is a blessyd tokyn'), pale urine, citrine-coloured urine, ruffe or red-coloured urine, which is to be distinguished from red water, and this again from rubicund urine. The treatise then reconsiders black water and green urine. A description of the parts of the urine leads to a very crude anatomical

description of the body, for the writer supposes that if the urine in a urinal be arbitrarily divided into fourths the upper part is derived from the body above the pomum Adami or throat ball, the second quarter from the parts above the diaphragm, the third part from the belly, and the grounds or sediment from the organs of generation. Upon this is founded the science and art of Urinoscopy, for which rules are given. Urinoscopy shows that various substances may be present in the urine besides blood, fat, and pus. There may be gravel, sand, hair, scales, 'crinoides' which 'be grete scalis as whete onys'. Gouty urine and the urine in pregnancy is dealt with. Ashy urine is followed by a dissertation on spermatorrhœa; remarks on urinary deposits and on prognosis from the urine close the treatise.

It is clear from a consideration of his works that John Arderne was at heart an operating surgeon. The wars of the fourteenth century were prolific in arrow-wounds, spear-thrusts, and stabs, for the fighting was hand to hand and there was no general use of gunpowder. At home the jousts and tourneys provided many opportunities for the surgeon. Prolonged exposure on horseback with heavy armour was a frequent cause of ischio-rectal abscess followed by fistula in ano, whilst the rigours of war made the armies verminous. All these points are illustrated in Arderne's treatises. Wounds and fistulæ interested him most, and the new methods which he adopted for their treatment puts him in the forefront of European surgeons and makes him worthy to rank with William de Salicet, Henri de Mondeville, and Gui de Chauliac. He had learnt the great secrets of success in surgery—fearlessness as regards bleeding, cleanliness, infrequent dressing of wounds, three points which are easy for us to grasp but were most difficult for mediæval surgeons who had no means of arresting hæmorrhage, and who had been taught for ages that wounds could only heal properly if they suppurated and so discharged their venom. In addition to his skill as a surgeon Arderne was endowed with a sound common sense which enabled him to recognize the limitations of his art, and when a case was incurable he had no hesitation in expressing his opinion even when he lost his patient by so doing. He was, therefore, absolutely honest if he be judged by the professional standards of his own day, rather than by those of later times. He had too a sound knowledge of herbs and was a great pharmacist. The 'Valences' which he invented (*Treatises of Fistula in Ano*, &c., Early English Text Soc., No. 139, p. xxxi) long outlasted his reputation as a surgeon, for they even reached the first Pharmacopœia of 1618, and Alleyne in *A New English Dispensatory*, published in 1733, devoted several paragraphs to them. There is no doubt that Arderne recognized the value of faith-healing, for he employed charms and amulets just as a modern surgeon allows a patient with inoperable cancer to obtain consolation and fresh courage from a 'cancer curer' in whom he has himself no particle of belief so long as the cancer curer is a mere fanatic

and not a money-making charlatan. For the most part, however he liked facts and was but little disposed to rely upon hearsay evidence.

He was a well-read man, for he quotes the following authors :

Bernard of Gordon, fourteen times.

Galen, seven times.

Magister Gwydonem, i.e. Guido or Gui de Chauliac, once.

Magister de Hocheswerth or Hokkesworth, three times. It would be interesting to learn more about this surgeon. Arderne speaks of him in very high terms and it may well prove that he was the master under whom Arderne served his apprenticeship.

Magister de Anquyll, once. I cannot identify him.

Magister Richard, in *Micrologo*, once. This is one of 'the four masters', who remain for us mere ghosts of names, though they exercised a great influence on many generations of surgeons, their successors.

Magister W. de Burgo, once. This surgeon, too, can no longer be identified.

'The Masters of Salernum,' once.

Ypocras, in a Latin translation, four times, and in a 'booke called Afforisms' twice.

Avicenna, also in a Latin translation, seven times.

Dioscorides, five times.

Lanfranc, eight times.

Haly, once.

John of Gaddesden, twice, and both times in connexion with the diseases of women.

Egidius, twice.

Platearius, once.

Johannicius, once.

John Damascene, three times.

John de St. Amando, once.

Constantyn, once.

Rhazes, once.

There is no doubt therefore that he had command of a good library of medical works, and that the works of his contemporaries like Gordon, Guy, and Henri de Mondeville were well known.

He seems to have been a man of wide interests outside his professional knowledge. He copied a receipt for Greek fire and tried to obtain a constant light by utilizing the phosphorescence of glow-worms. Some of his prescriptions are written in French, as might have been expected from one who lived amongst the higher classes in the fourteenth century, and, from the little word-list, it is clear that he was interested in other languages besides his own as he gives the Flemish and Irish equivalents.

The social state of his time is shown by many incidental touches. There is the receipt for the cure of a foundered horse; the difficulties about the time when clocks and watches were non-existent and the hour

is fixed by the church services and cock-crow; the grades of the patients, chiefly knights and priests, sometimes citizens, occasionally ladies. Hysteria and neurasthenia common, epidemics on a large scale not infrequent, so that Arderne was able to quote cases by the hundred. Hydrophobia and rabies sufficiently familiar to enable him to give a first-rate account of the symptoms; tetanus and facial paralysis distinguishable the one from the other; and cancer, in the sense that we now use the word, clearly described.

In the profession Arderne mentions various grades. There was the 'lady' who gave simple advice and treatment; the apothecary who sold drugs and plasters; the leech, sometimes skilful, more often foolish, who treated the patient before he brought him to the master surgeon such as was John himself; lastly, the physician with whom the master surgeon often consulted and seemingly on more equal terms than was the case several generations later.

I have not been able to discover any additional facts about John Arderne since the issue of his treatises in 1910. John of Gaunt's Register, edited by Mr. Armitage-Smith (Camden Society, series iii, vol. xxi, 1911), shows that there were two persons of the name of Arderne in the Prince's household. The one, William dardern, 'our well beloved valet', was appointed the Parker or Ranger of Pickering in the North Riding of Yorkshire; the other, John Ardern, was the Steward or Seneschal of 'our manor of Passenham in the County of Northampton'. William dardern was dead in August 1374, because inquiries were then being made about certain houses which had been granted to him at Pomfret. The only mention of John Ardern is that he was Seneschal on October 7, 1375.

The same Register contains interesting details about the rate and method of paying the medical attendants in the households of great people in the fourteenth century.

'John Bray, our physician, to have x lib. a year from our manor of Kyngeston in Dorset, a bouche en court as a chamberlain & two horses and the wage of one boy with ii sol. per day for travelling expenses.' The warrant is dated at the Savoy, September 20, 1372. Two days later, on September 22, 1372, the allowance for travelling is increased from two shillings to three shillings a day. The grant is confirmed on August 17, 1375, and on July 14, 1373, it was ordered that he should receive 'a deym de grece' or present of venison. It was this John the Minorite, 'Johannes de ordine Minorum, in armis bellicis strenuus, in physica peritissimus, domino Johanni duci Lancastriae familiarissimus', as he is described by the Chronicler, who was murdered by the London mob when the Savoy was burnt in 1381. His colleague was Frere William de Appilton, physician and surgeon, who was granted 'xl marks in time of peace or war from the honour of Pomfret; in war time other xl. marks, a bouche en court as a gentleman, clerk, or esquire or a chamberlain; four horses and wages for two garçons'. The warrant is dated at the Savoy on March 15, 1373.

The Royal Library at Stockholm contains a précis of Arderne's writings in the form of a manuscript on eight pages of vellum made into a roll of about five yards in length. A copy of this roll has been made for Mr. H. S. Wellcome's Historical Medical Museum. It shows that the original is written in three columns and is abundantly illustrated. It is in Latin, and is apparently a very short abstract of Arderne's works. A later hand has added the date 1412. Some of the birth figures resemble those in Raynald's *Byrth of Mankynd*.

[Friday Morning, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

**ANATOMISCHE ILLUSTRATIONEN AUS DEM ALTER-
TUM IN DER MITTELALTERLICHEN TRADITION
DES MORGENLANDS UND ABENDLANDS**

VON PROFESSOR KARL SUDHOFF, LEIPZIG

VOR fünfzehn Jahren publizierte Prof. Robert Fuchs (Dresden) nach einer griechischen Handschrift des 16. Jahrhunderts auf der Pariser Nationalbibliothek drei menschliche Figuren mit Beischriften, die er als anatomische Tafeln aus dem griechischen Altertum bezeichnete, die auch schon publizierte Parallelen aufweisen. Es gibt aber doch noch mehr in das innere anatomische Detail des Menschenkörpers gehende Zeichnungen mittelalterlicher Handschriften des Abendlandes, die für die erste Lehrstufe des anatomischen Unterrichtes bestimmt waren und genau in der gleichen Haltung und Zeichnung in persischen Handschriften des Mittelalters sich finden, während die eigentliche arabische anatomische Literatur infolge religiöser Vorurteile nicht in der Lage war, aus der Antike überliefertes anatomisches Illustrationsmaterial zu reproduzieren. Dass diese anatomische Tafelserie auf alexandrinische Lehrvorlagen an letzter Stelle zurückgehen, also für den dortigen medizinischen Unterricht ursprünglich gezeichnet worden waren, unterliegt nicht dem geringsten Zweifel. Die Kindslagenbilder zu Soranos-Muspo wie die Verbandzeichnungen zum Soran und die Illustrationen zur hypokratischen Einrenkungsmethodik des Apollonios von Kition bilden hierfür die zwingenden Beweisstücke.

Vortragender weist dies nun an einer Bilderserie der Arterien, Venen, Knochen, Nerven, Muskeln, an zahlreichen Exemplaren dieser Serien vom 2. bis 15. Jahrhundert nach und geht dann auf die graphischen Darstellungen der Einzelorgane im Mittelalter ein, die grossenteils gleichfalls auf antike Vorbilder sich werden zurückführen lassen.

[Friday Morning, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

**DIE SÄGE: KUNSTHISTORISCHE MEDIZINISCHE
STUDIE**

VON PROFESSOR EUGEN HOLLÄNDER

MEINE HERREN! Aus dem Grenzgebiete der Verwertung künstlerischer und kunstgewerblicher Objekte zu medizin-historischen Zwecken möchte ich Ihnen heute einen Beitrag liefern zur Geschichte der antiken Instrumentenkunde im allgemeinen und der Entwicklung der Säge im besonderen.

Um uns über das Vorhandensein, das Aussehen und Material, sowie über die Verwendung von ärztlichen Instrumenten zu unterrichten, dazu standen bisher vornehmlich zwei Wege offen. Einmal das Studium der alten Schriftsteller, sodann das Studium der Objekte selbst.

Die alten Schriftsteller, wenigstens der graecolateinischen Kultur, erwähnen die Instrumente, setzen aber dieselben als bekannt voraus, beschreiben sie nicht und bilden sie nicht ab. Jedenfalls fehlen solche in den uns überkommenen Manuskripten. Dort wo die antiken Autoren schematische Illustrationen vielleicht einmal ihrem Werk zugefügt haben, liessen die Kopisten solche weg. Zuerst bei den Arabern finden sich Abbildungen von Instrumenten. Es kann demnach nicht erstaunen, dass wir über das Rüstzeug des antiken Arztes nur oberflächlich orientiert sind. Unsere Kenntnis beruht auf den Ausgrabungsgegenständen. Solche haben sich in ziemlich umfangreicher Menge aus der Erde heben lassen. Doch müssen wir bedenken, dass natürlich nur solche Gegenstände dem berühmten Zahn der Zeit trotzten, welche aus widerstandsfähigem Material gefertigt waren. Tatsächlich sind es denn auch im wesentlichen bronzene Gerätschaften, die wir in reicher Menge gefunden haben. Schon vor über 150 Jahren hat Bajardi (1755) Funde aus Herculaneum beschrieben. Doch gab der grosse Instrumentenfund im Jahre 1819 im Hause des Chirurgen in der Via Consulare in Pompeji erst die geeignete Unterlage zum Rekonstruktionsversuch des antiken Instrumentariums. Einzelne solche Gegenstände wurden massenhaft, namentlich in den Gebieten des römischen Kolonialreiches, gefunden. Die Vermutung, dass es sich um chirurgische oder ärztliche Dinge handle, stützte sich teils

auf dem gleichlautenden Aussehen des modernen Gegenstandes (wie Pincetten und Sonden), teils auf der Tatsache, dass ähnliche Gegenstände aus Kollektivfunden herrühren. Im Laufe der letzten 100 Jahre ist nämlich eine ganze Reihe von Sammelfunden gemacht worden. Teils lagen die Instrumente zusammen in einer Urne beigegeben dem Grabe eines Arztes oder auch sie befanden sich noch in einem Besteck vereinigt. Derjenige Fund z. B., der nach dem pompejanischen die grösste medizin-historische Bedeutung hatte, war der, den ein Architekt auf dem Boden des alten Lutetia machte im Quartier St. Marcel. Diese 17 in einem Bronzegefäss vereinigten Instrumente und ein halb Dutzend anderer Gegenstände gaben Veranlassung zu der trefflichen Studie von Dr. Denéffe. In neuerer Zeit sind unsere Kenntnisse durch Kollegen Meyer-Steinegg gefördert worden und die fleissige Arbeit von John Steward Milne. Das Studium dieser Arbeiten lässt die grossen Lücken in unsern Kenntnissen am besten erkennen. *So müssen Instrumentenabbildungen aus ganz heterogenem antiken Darstellungskreise als Ergänzung unserer Anschauung sehr willkommen sein. Ich habe an anderer Stelle gezeigt, dass man hier im wesentlichen auf die antiken Grabdenkmäler von Aerzten angewiesen ist und nur gelegentlich noch hoffen darf, auf den Vasenbildern einschlägiges Material zu finden.*

Nach dieser Vorausschickung wollen wir versuchen, uns heute nur über die *Entwicklung der Säge* ein Bild zu machen. Hierbei konstatieren wir zunächst, dass dieser Gegenstand in den bisherigen Publikationen die bescheidenste Rolle spielt. Milne erwähnt im ganzen die Säge aus dem *Britischen Museum*, die er abbildet, ohne sich näher auf ihre Struktur einzulassen, und die Stichsäge des Neapolitaner Museums.

Diese Säge (Abbildung)¹ ist 11 cm lang, ihre Herkunft unbekannt. Gurlt bildet unter seinem antiken Instrumentarium die Säge unter den griechischen Instrumenten überhaupt nicht ab, unter den römischen kennt er nur ein Exemplar einer kleinen feinen Säge aus dem *Röm.-Germ. Museum in Mainz*, deren chirurgische Bestimmung sehr fraglich ist. Die einzige in Pompeji gefundene kleinere Säge konnte ich zu meinem Bedauern trotz energischen Versuchs nicht zur Abbildung bringen. Statt dessen zeige ich Ihnen hier das Exemplar der *Sammlung Meier-Steinegg* aus Ephesos und eine ähnliche *Stichsäge aus Athen*, deren Handgriff in ein Tierornament ausläuft. Die Kleinheit der Säge erhellt aus dem Vergleich mit den beigelegten Sonden.

Diese geringe Auswahl von Exemplaren dieses nützlichen Instrumentes ist schon sehr auffallend, wobei es noch obendrein fraglich ist, ob diese gefundenen Sägen nun auch chirurgischen Zwecken gedient haben. Da wir nun aber wissen, dass die Säge als solche ein uraltes, in vielen Berufen verwandtes Gerät war und dass ferner Knochenoperationen und Amputationen ein schon dem Corpus Hippocraticum bekannter

¹ Die Abbildungen der im Lichtbilde gezeigten Gegenstände fehlen an dieser Stelle.

Eingriff waren, so erscheint der Versuch berechtigt, über das Vorkommen der Säge, ihre Popularität, wenn ich so sagen darf, als Gerät überhaupt im Altertum uns auf andere Weise zu vergewissern. Wir sehen auf Grabdenkmälern der Aerzte Instrumentenbestecke angebracht, auch solche mit den Utensilien der grossen Chirurgie.

Ich führe Ihnen hier im Bilde zunächst die mir bekannt gewordenen und auch von mir schon an anderer Stelle publizierten chirurgischen Bestecke dieser Art vor, zunächst das Besteck der Telesphorus an der Asklepiosstatue Wiegands. Hier in Detail (Bild) sieht man eine Schere und anderes, aber keine Säge. Sodann die bekannte Basis aus Athen (Bild) mit den Messern und den beiden nebenstehenden Schröpfköpfen.

Ferner den Grabstein mit der Instrumentenpyxis (Bild) aus Palästina (hier das Detail mit Messern, Sonden, Löffeln, Pincetten, keine Säge), den Grabstein ferner des römischen Legionärs (Bild), den antiken Sarkophag des griechischen Arztes mit dem Instrumentenkasten (Bild). Auf diesem bemerkt man hier an dieser Stelle ein Ballon mit Ansatz. Es ist der einer antiken Spritze; die Verwendung desselben erkennen Sie aus diesem Bilde. Ferner das hellenistische Relief aus dem Berliner Museum und den Stein aus dem Lateran. In all diesen Instrumentenkästen sehen Sie zum Teil auch namentlich bei dem letzteren Instrumente der grossen Chirurgie. Es fehlt aber auf diesen Dokumenten, die gewissermassen das Wesen der chirurgischen Tätigkeit ausdrücken sollen, vollkommen die Andeutung einer Säge. Das ist deshalb besonders auffallend und charakteristisch zugleich, weil im allgemeinen die künstlerische Darstellung der Säge besonders einfach und eindeutig ist. Die Sägezähne sind, wie wir bald sehen werden, selbst auf stark demolierten Darstellungen noch deutlich erkennbar.

In der Neigung, für alle menschlichen Erfindungen einen anerkannten Vater zu besitzen, haben die Griechen *den Dädalus zum Erfinder der Säge* gemacht. Plinius sagt im 7. Buche, Kapitel 57. 6: 'Die Bearbeitung des Eisens wurde von den Cyklopen erfunden. Das Töpferhandwerk erfand der Athener Choröbus. Die dabei nötige Scheibe der Scythe Anarchis, *die Bearbeitung des Holzes* und die dazu nötigen Werkzeuge: die Säge, die Axt, das Bleilot, den Bohrer, den Leim Dädalus. Dies hellenische Personifikationsbedürfnis wird natürlich Lügen gestraft durch die Funde aus prähistorischer Zeit. Das Sägen ist ein modifiziertes Schneiden, und der mit schartigem Messer Schneidende wird unbewusst von selbst zum Erfinder der Säge. Gerade unter den Steininstrumenten der neolithischen Periode finden wir gelegentlich Steinsägen in den verschiedenen Formen. Diese vorgeschichtlichen Sägen und sägeähnlichen Handhaben waren nun aber weniger geeignet Holz zu schneiden, als Knochen und Horn zu bearbeiten. Wir müssen hier in erster Linie auch an die Schädeloperation, die Trepanationen denken und an die Bearbeitung von Schädeln Gestorbener. Auf die Steinsägen folgten eherne Nachbildungen in der Bronzezeit; solche bronzenen Sägeblätter finden sich häufiger. Die späteren eisernen sind meist ein Opfer der Oxydation

geworden. Die Holzbearbeitung war, wie wir sahen, nach hellenischer Auffassung die Erfindung von Dädalus, und auf vielen Darstellungen dieses heute durch die moderne Flugtechnik wieder zu Ehren gekommenen Erfinders finden wir ihn dargestellt mit der Säge in der Hand. Meist handelt es sich um die Szene der Fertigstellung der Holzkuh für Pasiphaa. Es ist nun vom kulturhistorischen Standpunkt bemerkenswert, dass Dädalus hierbei dargestellt wird, indem er meistens einen *Fuchsschwanz* in der Hand hat, d. i. diejenige Sägeform, welche für die ägyptische Kultur typisch ist. Aegyptische Sägen aus dem zweiten Jahrtausend vor Christi sind uns im Original sowohl wie auch in der Abbildung mehrfach bekannt geworden. Auch gab man Handwerkern unter anderen Instrumenten solche Miniatursäge mit ins Grab. Ich zeige Ihnen hier eine solche ägyptische Darstellung von Handwerksgerät aus dem mittleren Reiche (Bild).

Demgegenüber müssen wir betonen, dass in Griechenland und auch in dem etruskischen und römischen Kulturkreise beinahe alle Sägeformen bekannt waren, deren Modelle uns auch heute geläufig sind. So zeige ich Ihnen hier auf einer Vase des Berliner Museums eine richtige *Bogensäge* (Bild), bei der auch die Einspannung des isolierbaren Sägeblattes deutlich sichtbar wird. Die Darstellung selbst bezieht sich auf eine Szene aus dem trojanischen Krieg: Athene verfertigt das Modell zum trojanischen Krieg. Die lange sog. *Schrotsäge* (Bild), für zwei Arbeiter bestimmt, mit zwei an den Enden angebrachten Oeffnungen zum Hereinstecken querer Handhaben, sehen Sie hier an der Wand hängen in einer antiken Werkstatt einer Bronzegießerei und Kunstwerkstätte. (Synthesma bei einem Arbeiter!) Endlich die auch heute noch gebräuchlichste Form der gewöhnlichen *Holzsäge* (Bild), von zwei Männern bearbeitet, finden wir auf einem etruskischen Sarkophag der Leidener Sammlung (Bild). Dasselbe Modell in detaillierterer Ausführung, wobei selbst das durch einen Hebel drehbare Seil zum Anspannen und Nachlassen des Sägeblattes erkennbar ist, finden wir auf einem Relief des *Museums Capitolinum*. Daneben liegt eine andere Säge, alles Gegenstände zu Opferhandlungen für den Minervadienst. Kürzere kleine Sägen mit und ohne Rücken, aber meist konvexer wie unser sog. Fuchsschwanz waren, wie mir scheint, für gärtnerische oder ähnliche Zwecke vielfach in Anwendung. Ich fand eine solche abgebildet einzeln ohne weiteres Beiwerk in den *Kalixtus Katakomben* bei Rom und finde denselben Gegenstand noch deutlich erkennbar auf einem Relief aus dem römischen Gallien (Abb., bei Esperandieu, *Receuil des Bas-reliefs de la Gaule Romaine*). Diese Uebersicht, die nur einen kleinen Ueberblick aus dem vorhandenen bildlichen Material von nicht chirurgischen Sägen aus dem Altertum bedeutet, bringt nun den unzweifelhaften Beweis, dass die Säge als solche in ihren verschiedensten Abarten für allerlei Berufszwecke: Bauhandwerker, Metallarbeiter, Kunsthandwerk, Gärtnerei, Tischlerei ein notwendiges und bekanntes Instrument bedeutet. Wenn wir nun bisher in keiner einzigen Darstellung eine Beziehung der Säge zur chirurgischen

Tätigkeit feststellen konnten, so ist das so auffallend, dass wir wohl mit einiger Sicherheit sagen können, dass dieses Instrument in dem Instrumentarium eines antiken Operateurs nur eine ganz untergeordnete Rolle spielen konnte.

Wenn wir die vorhandenen hier im Lichtbilde gezeigten antiken Originalsagen betrachten, z. B. die aus Athen mit dem zierlichen Handgriff mit dem Tierornament, sodann die Säge von Meier-Steinegg aus Ephesus, dann die 11 cm lange Bronzesäge aus dem Britischen Museum, so wird mir jeder Chirurg darin recht geben, dass man mit solchen Sägen keine Unter- oder Oberschenkelamputation ausführen, sondern höchstens Fingerphalangen und Rippen durchsägen konnte. Allerdings spricht *Paulus von Aegina* davon, dass das Durchsägen lange Zeit in Anspruch nimmt. Milne und Meier-Steinegg beziehen schon das Wort 'Prion' bei Hippokrates nicht auf eine Amputationssäge, sondern auf einen Krontrepan. Wenn nun *Celsus*, *Archigenes*, *Heliodoros* und *Paulus* Amputationen der grossen Extremitäten vorgenommen haben, so werden sie vielleicht die vorhandenen grösseren Sägen dazu benutzt haben. Jedenfalls werden diese Operationen sehr selten gewesen sein. Ein Weg zur Konstatierung dieser Frage ist der, dass man das antike Knochenmaterial einmal vom Standpunkte der Amputation untersucht. Nach meinen Informationen, die allerdings bisher nur ganz oberflächlich waren, hat das genauer studierte ägyptische Mumienmaterial bisher keinen Anhaltspunkt gegeben, dass Amputationen vorkamen.

Der 'Tractatus de operatione manus seu de chirurgia albucasis' enthält als *erstes medizinisches Werk überhaupt, welches illustriert ist, Abbildungen auch von chirurgischen Sägen*. Ob Albucasis diese chirurgischen Instrumente dem *Paulus von Aegina* entnommen hat, ist zum mindesten fraglich. Albucasis bildet eine grosse und eine kleine Bogensäge ab, die aber schematisch gezeichnet aus einem Stück besteht, und mehrere konvex gebogene Blattsägen. Aus den Darstellungen in den Medizinschriften sowohl wie aus der Beschaffenheit der erhaltenen Originalien ersehen wir nun den Einfluss der Kunstrichtung auf die Gestalt namentlich der Bogensäge. *Hieronimus Braunschweig* bildet eine ziemlich primitive Säge (Bild) in seinem Instrumentarium ab, wobei ich darauf hinweise, dass sowohl auf dieser Abbildung wie auch auf der nächsten (Bild) des *Hans von Gersdorf* eine ungleichschenklige Anordnung der Zahnreihen gezeichnet ist, bei der nur eine Sägerichtung möglich ist, während dies bei den Sägen des *Andrea de la Croze* (Bild) schon nicht mehr der Fall ist. Hier merken Sie schon den Einfluss der italienischen Renaissance in der Ausführung des Sägengerüsts. Eine kleine Säge mit schönen Verzierungen aus der Zeit der deutschen Renaissance (Bild) mit Goldintarsien zeige ich Ihnen hier.

In der weiteren Folge nehmen nun die Sägen die Barockegestalt an, und es ist ohne weiteres z. B. nicht von dieser Säge mit den vielen Verschnörkelungen zu vermuten, ob es eine chirurgische Säge ist oder nicht. Ein ähnliches Exemplar liegt in der schönen Sammlung Wellcomes aus.

Selbstverständlich wird gelegentlich auch eine ursprünglich zu andern Zwecken verfertigte Säge einmal chirurgische Dienste geleistet haben. Der ganze Bau dieser grossen schweren Bogensäge spricht zunächst gegen ein medizinisches Instrument. Wir können aber hier auf dem *Gemälde des Franken* aus dem Antwerpener Museum genau dieselbe Säge als Handwerkszeug der heiligen Patrone der Medizin bei ihrem Wunder der Transplantation des Araberbeines identifizieren.

In der Entscheidung der Frage, ob die Säge eine chirurgische ist oder nicht, kann das *Sägenblatt* manchmal die geeignete Auskunft geben. Leider aber fehlt bei den älteren Stücken dasselbe meist oder das Blatt ist später einmal ersetzt worden. Für unsere Knochensägen kommen natürlich nur solche Sägeblätter in Erwägung, bei denen schmale, niedrige und scharfe Zähne vorhanden sind. Meistens scheint die Anordnung der Verzahnung in der Weise erfolgt zu sein, dass das spitzwinklig gleichschenklige Dreieck gewählt wurde. Mit dieser Form der Verzahnung ist auch die wirksamste Bewegungsrichtung, nämlich nach beiden Seiten, möglich, während eine Verzahnung mit ungleichschenkligen Dreiecken immer nur die Sägearbeit in einer Richtung gestattet.

Zunächst die gewöhnliche glatte grosse französische Säge des 17. Jahrhunderts hier im Original (Lichtbild) und hier im Bilde des aus Instrumenten zusammengesetzten Chirurgen. Sodann die spätere *Verrohung* der Form im 18. Jahrhundert durch das Gusseisen (hier ein Exemplar v. J. 1735).

Ich zeige nur noch zum Schluss die erste Form der runden Scheibensäge mit oben auswechselbaren Blättern.

Die weitere Entwicklung der Säge in der Form der Kettensäge, Drahtsäge und der elektrischen Säge hat mehr ein medizinisches als historisches Interesse.

[Friday Morning, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

**DID NAPOLEON BONAPARTE SUFFER FROM
HYPO-PITUITARISM ('DYSTROPHIA ADIPOSO-
GENITALIS') AT THE CLOSE OF HIS LIFE?**

By LEONARD GUTHRIE, M.D.

DR. ARNOLD CHAPLIN¹ and Professor Arthur Keith² have recently thrown new light on the mysterious nature of Napoleon's last illness and the cause of his death.

Dr. Chaplin's careful study of all the available documents has led him to confirm the official report that the actual cause of Napoleon's death was cancer of the stomach undiagnosed during life. He meets the difficulty of reconciling this condition with the long duration of Napoleon's illness—four and a half years—and with the nature of the early symptoms, by assuming that the illness commenced with ulceration of the stomach, which ultimately became cancerous. He remarks that 'the hepatitis theory which loomed so largely in the St. Helena records finds no support in any of the three descriptions of the appearance "post mortem" and must be dismissed from the domains of practical considerations', pp. 67-8.

Professor Keith, on the other hand, maintains that the diagnosis of hepatitis, upheld by all Napoleon's attendants who were not biased by political influences, was correct, and that the hepatitis and perihepatitis found after death were secondary to some form of Mediterranean fever, or 'undulant fever', endemic in the island of St. Helena. In support of his contention he cites the reports by Sir Frederic Eve and Mr. Shattock on the microscopic appearances of the specimens of intestines reputed to be those of Napoleon, which are now in the College Museum. The plaque-like growths in these specimens are not, he declares, 'secondary growths of cancer,' as they were originally held to be, but 'inflamed hyperplastic enlarged patches of the lymphoid tissue which abounds in the lower part of the small intestine, and which is so often affected in general infection of the body'.

¹ Arnold Chaplin, M.D., *The Illness and Death of Napoleon Bonaparte*, 1913, Hirschfield Bros., Ltd.

² Professor Arthur Keith, 'History and Nature of the Napoleonic Specimens in the Museum of the Royal College of Surgeons, England,' *Lancet*, January 18, 1913, p. 187.

I do not propose to criticize or discuss these views. There can be no doubt that Napoleon suffered from cancer of the stomach, and it is highly probable that he also suffered from hepatitis and peri-hepatitis following some sort of fever known to be endemic at St. Helena at the time. Professor Keith's conclusions are strongly supported by the morbid condition of the intestinal specimens which he asserts to be undoubtedly those of Napoleon.

My purpose is to draw attention to another aspect of Napoleon's case, which as far as I know has not hitherto been presented, namely, that towards the close of his life he suffered from *hypo-pituitarism*, and that at a much earlier period he showed indications of some form of *dyspituitarism*.

The signs by which hypo-pituitarism may be recognized are :

1. Extreme and progressive obesity.
2. Disappearance of hair from the body.
3. Atrophy of the genitalia.
4. Feminine appearance of the body, and of the pelvic region in particular.
5. Fineness in texture of the skin, and delicacy of the extremities.

If we compare these physical signs with Henry's description of the appearance of Napoleon's body after death, they will be found to correspond in all particulars, and we may recognize Henry's description at once as that of a man suffering from hypo-pituitarism, or 'dystrophia adiposo-genitalis'.

Henry's account of the 'post-mortem' has now been printed in full by Dr. Chaplin, from the *Lowe Papers*, where it is in the form of a letter to Sir Hudson Lowe, and is dated Cavan, 1823.

It contains the following observations which seem to support the present writer's contention.

1. *Obesity*. 'The whole surface of the body was deeply covered with fat. Over the sternum, where generally the bone is very superficial, the fat was upwards of an inch deep, and an inch and a half or two inches on the abdomen.'

2. *Alopecia*. 'There was scarcely any hair on the body, and that of the head was thin, fine, and silky.'

3. *Atrophy of genitalia*. 'The penis and testicles were very small, and the whole genital system seemed to exhibit a physical cause for the absence of sexual desire and chastity which had been stated to have characterized the deceased.' It will be observed that Henry's comment is hardly in accordance with what is known of Napoleon's private life when in his prime, but it is in keeping with the opinion that in his latter days he probably became impotent in consequence of hypo-pituitarism.

4. *Feminine characteristics of the body*. 'The skin was noticed to be very white and delicate, as were the hands and arms. Indeed, the whole body was slender and effeminate. . . . The pubis much resembled the

"mons Veneris" in women. The muscles of the chest were small, the shoulders were narrow, and the hips wide.'

These physical signs seem amply sufficient to justify the diagnosis of hypo-pituitarism, and we may next inquire whether any of Napoleon's symptoms were in accordance with this diagnosis, and, if so, what was their duration. The main symptoms of hypo-pituitarism occurring in an adult are difficult to identify, as the condition is often associated with the indirect result of pressure by a tumour on the surrounding brain. But they seem to be in chief :

1. Psychical or mental, in the shape of changes in temperament, apathy, indolence, irritability, loss of memory, and sometimes of self-respect, or even of decency.
2. Readily induced fatigue and prostration.
3. Headache, vertigo, vomiting, and constipation.
4. Fainting fits or actual epileptic seizures, followed by slow pulse, somnolence, or stupor.
5. Lowering of bodily temperature, sensations of chilliness, and sometimes œdema of the extremities.

NAPOLÉON'S MENTAL FACULTIES AT ST. HELENA

It is agreed, even by his most ardent admirers, that Napoleon's mental balance was shaken after the campaigns of Austerlitz, Jena, and Friedland ; that the cool and calculating faculties on which his success in earlier life depended deserted him, and were replaced by rashness, grandiose ideas, and unlimited ambition. He himself admitted at St. Helena that 'the failure to make peace during the Congress at Chatillon, in June 1814, was "une lourde sottise"'.¹

But it is generally maintained that, although his powers of judgement may have forsaken him, his intellect and mental faculties were unabated. Any statement to the contrary may perhaps meet with indignant protest, for glamour always surrounds the 'man who was', and the sympathy and compassion which all must extend to a fallen star may lead us to exaggerate its brilliance, and to ignore the evidence of its extinction. Dispassionate students of Napoleon's life in exile must fail, however, to be impressed by the examples of his literary productions which have been cited in proof that his genius remained unimpaired. In truth, his elaborate and detailed study of incidents in the 'Siege of Troy' seems but a juvenile achievement. It was no mere 'jeu d'esprit', but a solemn and ponderous attempt to demolish and disprove stories of a purely legendary order. A vestige of the sense of humour and of proportion should have told him that he might as well have occupied himself in discussing the strategy employed in 'The Battle of the Frogs and Mice'. Again, one has been called upon to admire his 'Essay on Suicide' as the fruit of a mature philosophy ; yet candour compels one to admit that

¹ J. Holland Rose, *The Personality of Napoleon*, Lowell Lectures.

it contains no spark of genius, nor even originality. The best that can be said for it is that, for naïve and complacent correctness of thought and style, it might win a prize in some provincial academy.

We cannot forget, moreover, that certain grand and dignified utterances attributed to Napoleon at St. Helena were edited and embellished by Las Cases the journalist, no doubt, as he wrote in his diary, 'in order to excite a lively interest in a large portion of the population of Europe.'

It is pitiful to trace the mental decadence of this intellectual giant in the sordid details of his closing years. His puerile sulks and fits of temper, his vain insistence on a barren title, his ungracious reception of Lowe's attempts to alleviate his lot, his condescension to act the part of potentate in a court of obsequious Montholons, Bertrand and his silly wife, and Gourgaud the dullard, are significant enough. Perhaps the saddest indication of his mental decay is that Napoleon became a bore, as may be gathered from the description of his reading aloud to his companions night after night the tragedy of *Zaire*, and sternly rebuking poor Madame de Montholon when she fell asleep.

Napoleon, in fact, degenerated during the last five years of his life into a peevish, querulous, and prematurely aged man. It is difficult to attribute his deterioration to circumstances, to the climate of St. Helena, or to hepatitis, ulcer or cancer of the stomach, or to 'a form of undulant fever'. None of these conditions is associated with mental enfeeblement, nor with such loss of self-respect as is implied in Arnott's statement that 'he found the room and the bed-linen in a dirty state, for Napoleon had been allowed to expectorate anywhere at will' (*Lowe Papers*, vol. 20, 157, f. 3).

Some other explanation of his mental and physical decay is needed, and the theory that he suffered from gradual hypophyseal insufficiency seems to meet the case, and is in accordance with the appearance of the body after death.

DECLINE OF PHYSICAL ENERGY

A day of Napoleon's life at Elba is thus described by Sir Neil Campbell :

'After being yesterday on foot in the heat of the sun from 5 a.m. to 3 p.m. visiting the frigates and transports, he rode on horseback for three hours, as he told me afterwards, "pour se défatiguer".'

But Napoleon's restless and untiring energy at Elba were soon replaced by sloth and lassitude at St. Helena. At first we hear of him walking, driving, and exploring the island on horseback, but by degrees, during the first two years of exile, he abandoned horse-riding, and indeed every form of exercise. The accepted explanation is that he did so out of pique at the restrictions imposed upon him in consequence of his well-known escapade in evading his attendants and galloping out of bounds. It seems more probable, however, that he ceased to take exercise because he no longer felt the need 'pour se défatiguer'. Fatigue and prostration readily induced by exertion were, in fact, signs of the

insidious onset of hypo-pituitarism. From July 1818 to September 1820 Dr. Chaplin says that Napoleon was not seen by any medical man, only vague rumours of his failing health were heard. But Montholon states that Napoleon spent the greater part of the day indolently, with frequent recourse to hot baths, in which he remained for hours at a time. Now the climate of St. Helena is not cold, and this curious habit of Napoleon's may have proceeded from the sense of general chilliness to which the subjects of hypo-pituitarism are liable. In the later stages of his illness several references are made to the icy coldness of the extremities.¹

OBESITY

Napoleon was always inclined to stoutness, and comments were made on his increasing corpulence by most of his attendants. It was not unnaturally ascribed to laziness and want of exercise by those who maintained that he was only suffering from hypochondriasis, and it was certainly difficult to reconcile absence of wasting with the existence of any serious form of hepatitis.

Napoleon's last illness undoubtedly puzzled all who attended him, and it is unfair to charge them either with culpable ignorance, or—worse still—with gross professional dishonesty. The *dénoûment* came as a surprise to all, because the symptoms of ulcer, cancer of the stomach, hepatitis, and 'undulant fever' were atypical. They were masked by 'dystrophia adiposo-genitalis', a condition which could not be recognized at the time, as the functions of the hypophysis cerebri and of other ductless glands remained unknown.

Napoleon endeavoured to combat his increasing lassitude with some success, for between October 1819 and July 1820 he was out of doors engaged in gardening nearly every day, and in May 1820 he resumed exercise on horseback. But after and during September 1820 fatigue after the slightest exertion became pronounced, and frequent fits of lethargy were noticed. On October 4 he took his last ride in public, but was so tired that he had to come home in his carriage.

Carriage exercise and short walks were all that could be attempted, and even these taxed his strength severely. Dr. Chaplin considers that up to October 1820 indifferent health would have been a correct description of the condition of Napoleon; but that at that time a sudden declension took place, and thenceforth to the end he was dangerously ill. 'Something had happened which rapidly sapped the strength and produced symptoms of gastric disorder far more acute than those which had been endured for three years.' He attributes the exacerbation of pain, vomiting, weakness, and prostration to the development of a rapidly-growing cancer in the lips of a chronic ulcer of the stomach. It is easy to construe the symptoms in the light of the post-mortem

¹ Œdema of the feet was noticed for the first time in October 1816, and again in September 1817. (Chaplin, p. 13, op. cit.)

examination, but it must have been difficult to do so during life. It is inconceivable that Arnott, eight days before Napoleon became moribund, could have assured the British authorities that there was no danger, and that the disease was merely hypochondriasis, had not the symptoms been obscured by the mental and physical deterioration which, as is now contended, were the result of hypo-pituitarism.

THE NATURE OF NAPOLEON'S CEREBRAL SEIZURES, AND THE CAUSE OF HIS BRADYCARDIA AND FREQUENCY OF MICTURITION

There were certain conditions of medical interest connected with Napoleon's health which Dr. Chaplin thinks have been thrust into undue prominence by historians. In the present writer's opinion, however, they are of considerable importance as evidence that during the greater part of his life Napoleon was subject to some form of dyspituitarism which ended, as already maintained, in hypo-pituitarism.

These conditions were (1) an habitually slow pulse, which, according to Corvisart and others, rarely beat above 50 per minute. (2) A liability to 'occasional attacks of vomiting followed by a state of lethargy and stupor almost amounting to unconsciousness'. (3) Habitual frequency of micturition, ending in dysuria.

Napoleon's cerebral attacks occurred generally after prolonged physical exertion and mental strain, and outbursts of temper preceded them on more than one occasion. A particularly bad one is mentioned after the fatigue and disappointment consequent on the battle of Aspern.¹

If we may believe the statements of women whose society he frequented, such attacks were wont to follow sexual intercourse.

At St. Helena the attacks seem to have changed in character, for we learn that on January 17, 1819, Napoleon had a serious attack of vertigo followed by fainting, which appeared so grave that measures were taken to summon medical aid at once. The vertigo and faintness, which occurred more than once, were succeeded by headache. Stokoe, who was called in, apprehended apoplexy, but was evidently mystified, for, as Baxter subsequently pointed out, he recommended 'a more nourishing diet instead of blood-letting'. 'A nourishing diet', Baxter said, 'generally means animal food and wine. Such articles ordered for a patient who is considered to be in danger of a determination of blood to the head would convey suspicion either of the sincerity or professional talents of Mr. Stokoe.'

No doubt Stokoe was at a loss to explain the symptoms, and was guided rather by the evident prostration and weakness of Napoleon than by the rules of practice in cases of 'threatened apoplexy'. I do not know any references to similar attacks of headache, fainting, and vertigo, but mention is frequently made of fits of lethargy, somnolence, and vomiting during Napoleon's last illness. It is impossible to say

¹ Alison, *History of Europe*, xvii. 40.

whether the vomiting was due to local gastric disease, or was of cerebral origin, as seems to have been the case in earlier life. The habitual slowness of pulse seems to have been replaced by undue frequency at St. Helena, and complaint was made of palpitation and cardiac irregularity.

Dr. Chaplin rejects with some warmth the statement often made that Napoleon was epileptic. 'Gusts of passion and severe vomiting followed by lethargy', he says, 'are poor facts on which to brand a man with the stigma of epilepsy.' It is true that there is no evidence that Napoleon ever suffered from a genuine fit of epilepsy, yet it must be admitted that the attacks of vomiting followed by 'stupor verging on unconsciousness', set up by passion, excitement, and fatigue, were certainly of cerebral or epileptiform nature.

Cushing has recently drawn attention to the frequency of epileptiform tendencies in the subjects of pituitary disease. Thirteen out of eighteen cases showed these tendencies. Some had definite epilepsy associated with loss of smell, or olfactory or gustatory auræ. In other cases the attacks were those of unconsciousness unattended by convulsions, and followed by stupor. Sometimes there were attacks of semi-unconsciousness with slow pulse and low blood-pressure, or dizzy spells, headache, mental confusion, loss of memory lasting twenty minutes. He also alludes to types of epilepsy, often accompanied by an extreme lowering of temperature and slowing of pulse, occurring in obese subjects with ravenous appetites. Such epileptics, he says, are relieved by pituitary extract, and their attacks resemble those of patients suffering from demonstrable hypo-pituitarism. Cushing considers that the number of his cases showing epileptic tendencies—13 out of 18—is so large that the association cannot be regarded as merely coincidental. He suggests that a possible predisposition to cortical instability exists as a consequence of hypophyseal insufficiency.

Dr. Chaplin mentions that 'in recent days the exponents of the new cardiac pathology have regarded the slow pulse and the attacks of stupor verging on unconsciousness as indications that Napoleon suffered from partial or complete "heart-block"'. But complete or partial 'heart-block' is a grave condition; there is no evidence that his attacks—with the exception of the one at St. Helena—gave rise to any alarm, nor that he was in any way the worse for them. It seems, on the whole, more probable that Napoleon's bradycardia and liability to curious cerebral symptoms were caused by some abnormality of his hypophyseal secretion.

HYPERSECRETION ? OR HYPOSECRETION ?

It is not easy to decide how far Napoleon's dyspituitarism was in the direction of excess or defect of pituitary secretion. The well-known physiological action of pituitary extract is to slow the pulse, raise blood-pressure in general, and that of the cerebral circulation in particular. It may therefore be that Napoleon's habitual bradycardia was due to

hypersecretion, and that his attacks of vomiting, followed by signs of cerebral exhaustion caused by fatigue or excitement, were the result of temporary cerebral anæmia, which in turn depended on some vascular cerebral disturbance. Pituitary extract is also a powerful diuretic, and this suggests a possible explanation of the *urinary* trouble from which, Napoleon told Antommarchi, he had suffered all his life.

Now Ségur says that after the battle of Borodino Napoleon had an aggravation of his habitual complaint, 'dysuria,' and that the condition became so bad that riding caused considerable pain.¹ But Napoleon also told Antommarchi that irritability of the bladder would not permit him to sleep for more than a few hours at a time, and that he had *always experienced this trouble*. Since Antommarchi found at the post-mortem examination small calculi in the bladder and the coats of that organ diseased, there can be no doubt that cystitis was the cause of the painful strangury and frequent desire to micturate in later life. But it is impossible that this condition of cystitis should have existed throughout Napoleon's existence. It is far more probable that it came as an aggravation of a constitutional peculiarity, namely, polyuria and frequency of micturition due to hyper-pituitarism, and that Napoleon and his medical advisers confused this peculiarity with the symptoms of cystitis which ultimately occurred.

NAPOLEON'S SEXUAL LIFE

Henry, seemingly a follower of Gall and Spurzheim, notes the 'strong development of the organ of philoprogeneritiveness' in Napoleon's cranium. He then, with curious inconsistency, remarks on the appearance of 'the whole genitive system, which seemed to exhibit a physical cause for the absence of sexual desire and the chastity which had been stated to have characterized the deceased'.

In spite of inconsistency, his observations are not devoid of interest. Napoleon, whether 'philoprogeneritive' or not, seems to have been liable to sudden and vehement sexual impulses. If anecdotes are to be believed, these impulses beset him on occasions which were sometimes inconvenient, and a peculiarity about them was that they subsided with equal suddenness if not immediately gratified, or if, meanwhile, something occurred to disengage his attention. All women were to him but 'filles de joie'. Sexual rather than social attractions in women appealed to him, and he was incapable of lasting affection for any woman, or of regarding her as an intellectual equal and helpmate. The best women, in his opinion, were those who bore most children. Sexual gratification was the only kind of love he knew, and his remarks on the subject when at St. Helena must be taken as those of a man whose desire had failed, not as the mature reflections of a philosopher. It is true that scandals were afoot in regard to his sexual life while in exile, but these seem to have been unfounded,

¹ Ségur, *La Campagne de Russie*, ed. Nelson, p. 124.

and there is no reason either for doubting the chastity—during this period at least—to which Henry referred, or the physical cause to which he attributed it.

It is possible that Napoleon's abnormal 'libido sexualis' was due to hyper-pituitarism. For gigantism in early life is sometimes associated with precocious sexual development, and abnormal sexual activity may be a sign of early acromegaly. Cushing's first case is that of a man whom he describes as a 'veritable Gargantua' at the age of 35. At 19 he measured 6 feet 4 inches, and was of unusual strength. 'He was intelligent, a good student, and aside from an uncontrolled "libido sexualis" had good habits.' At 25 there were no signs of acromegaly, but they appeared at the age of 27. At 35 his height was 6 feet 6 inches, he was typically acromegalic, and had lost 'libido et potentia sexualis'.

The association of atrophy of the genital organs with lesions of the pituitary has led some authorities (Tandler, Gross, and others) to attribute the primary cause of the pituitary affection to the atrophy of the genital glands. But although changes are produced in the pituitary by castration, the physical results of castration do not resemble 'dystrophia adiposogenitalis', and it is much more likely, as Blair Bell maintains, that this condition is subsequent to a pituitary lesion.

THE PART, OR PARTS, OF THE HYPOPHYSIS CEREBRI WHICH WERE PROBABLY CONCERNED IN THE CAUSATION OF NAPOLEON'S DYS-PITUITARISM

As the head was not opened after death the condition of the hypophysis cerebri must remain for ever unknown. But modern investigations of the functions of the different portions of the pituitary gland suggest conclusions as to those portions which were probably affected in the case of Napoleon. Although authorities are by no means agreed in the matter, it seems to be fairly well established that the pars anterior or glandular portion is chiefly concerned in regulating skeletal growth, sexual activity, and temperature. Whereas the *posterior part*, or 'pars nervosa', which includes the pars intermedia, is more closely allied to metabolic processes, and especially to the metabolism of sugar, 'and also probably serves to promote contractility and tone of plain muscular tissues generally, as well as of the heart, and to excite the activity of certain glands, viz. the kidney and mammary gland' (Schaefer).

Gigantism in early life and acromegaly in later life are regarded as indications of hyper-pituitarism on the part of the anterior lobe.

Keith supposes that in such cases the organ supplies 'hormones' which render osteoblasts more sensitive to mechanical and other stimuli. Hitherto it has not been found possible to produce hyper-pituitarism in the shape of gigantism or acromegaly experimentally. Clinical evidence in favour of the view that acromegaly is due to hyper-pituitarism is that in some cases during pregnancy, when the gland is known to become enlarged, transient signs of acromegaly have been observed. But the

theory is mainly an inference drawn from the fact that experimental hypo-pituitarism (partial extirpation of the anterior lobe) causes 'acromegaly reversed', i. e. shortening of the skull and diminution in the size of the limbs (Crowe, Cushing, and Homans).

The other effects of experimental hypo-pituitarism are atrophy, or ill development of the genitalia, loss of sexual hair, feminine characteristics of the pelvis and skin in males, obesity, and lowered temperature.

The influence of the anterior lobe on temperature is shown by the *thermic reaction* which is produced by injection of anterior lobe extract in cases of definite hypo-pituitarism. In normal individuals, however, no such thermic reaction takes place. Cushing explains the paradox that gigantism and acromegaly are often, if not usually, associated with 'dystrophia adiposo-genitalis', by supposing that the exit of the secretion of the posterior lobe into the third ventricle through the infundibulum is blocked by a tumour. He finds that adiposity may attend tumours of either anterior or posterior lobe. Hypo-pituitarism of the posterior lobe is also indicated by diminished metabolism, diminished consumption of oxygen, and lessened output of CO_2 , and a high degree of tolerance of sugar, which is turned into fat and stored in that form in the tissues, thus accounting for the obesity.

The functions of the *pars intermedia* are far from being decided. They are probably not the same throughout life. In childhood the cleft between the anterior and posterior lobes is wider than in later life. Erdheim and Thom have described changes which occur in the hypophysis at about the age of 40, 'when the basophil cells of the *pars anterior* are seen to bridge over, generally at three or four points simultaneously, the cleft between the anterior lobe and the "*pars intermedia*", and thence to invade the "*pars posterior*". It is about this time, too, that small adenomata are frequently met with, while before that time they are rare.'¹

In the child, moreover, the cells of the anterior part contain less glycogen, and those of the posterior part less pigment than in the adult. During pregnancy, again, certain changes take place in the cells of the gland. 'The eosinophilia disappears and a large portion of the cells of the *pars anterior* becomes chromophobe and . . . have been called "pregnancy cells".'²

The histological and structural changes, therefore, which have been observed in the hypophysis at different life stages, may perhaps be taken to imply that in early life the anterior and posterior lobes have independent functions, whereas in later life the organ—as Blair Bell maintains—acts as a whole. The 'bridging over' of the *pars intermedia* by basophil cells passing from the *pars posterior* towards mid-life is in favour of Blair Bell's contention. It is impossible, however, at the present time to decide the question one way or another. Cushing's supposition that the paradoxi-

¹ Gerhardt Von Bonin, 'Study of a case of Dyspituitarism,' *Quarterly Journal of Medicine*, January 1913.

² Blair Bell, Arris and Gale Lectures, *Lancet*, April 5, 1913, p. 940.

cal association of gigantism and acromegaly with 'dystrophia adiposogenitalis' is due to blockage of the infundibulum, may be correct in some cases; but his simpler explanation is that hyper-pituitarism in time gives way to hypo-pituitarism, the osseous and tissue changes of the former remaining permanent whilst the changes of the latter are superadded.

Swale Vincent considers that the thyroid, parathyroids, and pars intermedia of the hypophysis may form one apparatus. But there seems to be a far wider correlation between the hypophysis and other ductless glands, which renders the whole question of their individual functions and influence over each other one of the greatest difficulty. Cushing found that extirpation of the whole of the pituitary gland or the whole of its anterior portion caused death in a short time. Biedl has stated that the posterior lobe (pars intermedia and pars nervosa) may be removed without producing symptoms.¹

Returning to the case of Napoleon, it is hardly necessary to state that he suffered neither from gigantism nor acromegaly. 'The features', Henry said, 'were regular and might be considered beautiful,' and this is born out by the cast of the face taken after death. He described the head as being of large size 'which must have been disproportionate to the body even in youth'. 'The forehead was very broad and full.' But Antommarchi's measurements show that the maximum circumference of the head—20 pouces 10 lines (old French) or 22.5 inches—was not above the average. The apparent disproportion was probably due to the large size of the face and the powerful lower jaw which characterized Napoleon. But the mandibular prognathism of acromegaly was absent, and the only signs of acromegaly which may be detected in Henry's description were the width of the hips and general feminine appearance of the pelvic regions, which are in keeping with the pelvic characters observed in male acromegalic subjects by Von Bonin, Lannois, and Roy, and shown, as Von Bonin states, in illustrations of cases recorded by Buday, Janesco, and Thomson.

Cushing has drawn attention to the 'maxillary prognathism' noticeable in subjects of hypo-pituitarism, and contrasts it with the 'mandibular prognathism' of acromegaly. Cushing's photos illustrating 'maxillary prognathism' have a marked likeness to each other, and some may detect a resemblance between these subjects of hypo-pituitarism and the portraits of Napoleon in his later years.

As regards the nature of the lesion in Napoleon's case, it is hardly likely to have been a tumour, because there is no evidence that the optic commissure was involved or that vision was in any way affected. But the presence of a tumour is not essential for the production of gigantism, acromegaly, and dystrophia adiposo-genitalis. All of these conditions may occur singly or combined, as the result of excess, defect, or alteration of the functions of the component parts of the pituitary body.

In conclusion, we have evidence that Napoleon, towards the close of

¹ Blair Bell, *op. cit.*

his life, suffered from hypo-pituitarism of the anterior lobe in the shape of genital atrophy, sexual alopecia, skeletal and tissue changes of feminine type, and lowered temperature. Hypo-pituitarism of the posterior lobe was perhaps indicated by obesity and lowered metabolism. How far his gradual failure of mental and physical energy was attributable to hypo-pituitarism on the part of the anterior or posterior lobes, or of the organ as a whole, must be left undetermined.

In regard to evidence of hyper-pituitarism in Napoleon up to the zenith of his career, one is on less sure ground. One can only adduce the habitual slowness of pulse, the lifelong frequency of micturition, the 'libido sexualis', and the anomalous cerebral attacks to which he was liable, as evidence of some form of dyspituitarism.

Time is not yet ripe for drawing any sweeping conclusions as to the importance of our ductless glands, but knowledge grows apace, and physiologists may in future come to regard not only our physical and sexual development, but also our mental, moral, and intellectual faculties, as measures of the activity of our glandular secretions.

[Friday Morning, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

THE FATAL ILLNESS OF NAPOLEON

BY ARNOLD CHAPLIN, M.D. (CANTAB.), FELLOW OF THE ROYAL
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THE extraordinary interest which the subject of Napoleon arouses at the present day was one of the reasons which prompted me to offer for your consideration a paper on the fatal illness of the great Emperor. Another was that the International Congress of Medicine appeared to afford an excellent opportunity for obtaining a medical verdict of a representative and international character on the nature of the illness,—a verdict which would command the respect and attention of all students of the Napoleonic period.

I would, therefore, respectfully ask the members of the Historical Section here assembled to consider themselves in the position of a tribunal or commission called together to decide the following questions :

1. What were the diseases from which Napoleon suffered during his detention on the Island of St. Helena ?
2. What were the probable causes of those maladies ?
3. How far did the results of the post-mortem examination substantiate the clinical evidence of those diseases ?

If you will accept the position of judges in this inquiry, and will accord me the permission to place the facts before you, I will endeavour to perform my task without appealing to your prejudices or sentiments in any way.

During the discussion which I trust will spring from this paper, gentlemen will, doubtless, address us who may be regarded as special pleaders in the cause of some particular disease from which it has been asserted the Emperor suffered. Indeed, I think no student of the subject can have failed to notice of late a somewhat alarming increase of the maladies which are reputed to have attacked Napoleon, and I would even venture to make an appeal, on behalf of the Emperor, to those who would multiply his illnesses, and ask them not to assign to him more of the ills than the flesh can be reasonably expected to inherit.

In presenting the case to you, unfortunately I have no witnesses to call, for Napoleon has been dead ninety-two and a quarter years, and

all the evidence I can offer has been taken, so to speak, on commission. However much you might desire to cross-examine the doctors in attendance, and in some cases that would be most interesting, yet it is impossible, and you must be content to take their recorded statements, and arrive at a conclusion from a consideration of them alone.

What is the nature of the medical evidence we possess of the illness of Napoleon while on the Island of St. Helena? It has come down to us in the form of books or reports furnished by eight medical men, viz. O'Meara, Stokoe, Antommarchi, Arnott, Shortt, Henry, Rutledge, and Burton. The four first named attended the Emperor during the various phases of his malady or maladies, while the last four were present at the post-mortem examination only, and can, therefore, speak of the pathological conditions found at the autopsy alone. O'Meara, Antommarchi, and Arnott have left behind them complete books dealing with the subject, while the statements of Stokoe, Henry, Rutledge, and Burton exist in the *Lowe Papers*, vols. 20,133, 20,157, 20,214; and the brief account from the pen of Shortt is found among his unpublished papers. Besides these sources of information, the *Lowe Papers* contain, in vols. 20,156 and 20,157, the original reports of O'Meara, Stokoe, and Arnott, and as the books of O'Meara and Arnott were published after the death of Napoleon, these statements are of much value as a means of checking the facts in the published works.

I must also ask you to remember that the mirror of truth has had its brightness considerably dimmed by the action of the violent passions and prejudices, both political and partisan, which filled the minds of those who were in close proximity to Napoleon in St. Helena. At this distance of time it is difficult to realize adequately the effect produced by these conflicting views in obscuring the proper proportions of the illness of the Emperor. Though stripped of all earthly power, the magnetic personality of Napoleon was still the storm centre, and in the narrow circle of his prison home, the minds of men were moulded to his imperious will as they had been when Europe was at his feet. In St. Helena truth was liable to be distorted by political intrigue. At every turn the policy of Longwood was matched against that of Plantation House, and anything likely to further the aspirations of either party was adopted with eagerness.

Briefly stated, the policy of Longwood sought to establish the fact that the detention of Napoleon was a long-drawn-out agony, while the British authorities attempted to prove with no less insistence that the captivity was running its course in a pleasant manner, and that everything was being done to mitigate the rigours of confinement, compatible with the safe custody of the prisoner. The party at Longwood proclaimed to the world that the climate of St. Helena, added to the harsh treatment meted out to the Emperor, had produced endemic hepatitis which was gradually killing him. This charge was met by the British authorities with a flat denial. They insisted that the illness was diagnosed wrongly,

and greatly exaggerated, if, indeed, it existed at all. They refused to believe in the theory of endemic hepatitis, since acquiescence would damage their contention that St. Helena was an ideal place in which to confine a fallen Napoleon. As usual, the truth lay between these two extremes.

It is not surprising, therefore, that the canker of exaggeration and violent partisanship ate its way into the deliberations of the doctors, vitiated their views, and divided them, after the manner of their superiors, into two hostile camps, of which one was representative of the policy of Longwood and the hepatitis theory, while the other was for the British authorities and its practical negation of ill health. In this difference of opinion O'Meara, Stokoe, and Antommarchi represented the Longwood policy of Napoleon and his followers, while Arnott, Baxter, Shortt, Henry, Rutledge, and Burton were responsible for upholding the views of the British authorities.

Now if the account just given of the political condition existing in St. Helena be true, it follows of necessity that all the evidence we have must be treated as suspect, and must be subjected to a rigorous investigation, if we are to arrive at a conclusion free from prejudice and error. The problem of deciding the nature of the illness of Napoleon will be solved with greater ease if we confine ourselves to a consideration of the clinical evidence first, and leave the pathological facts until the end of the paper.

What clinical evidence have we on which to form an opinion? From the day Napoleon left Plymouth Roads to July 25, 1818, all the medical evidence we possess proceeds from the able pen of Barry Edward O'Meara. During that period no other medical man saw Napoleon professionally, for the visits of Dr. Baxter were those of courtesy only. The evidence of O'Meara is found in his famous *Voice from St. Helena*, published after Napoleon's death, and in a series of reports of the condition of the emperor's health, addressed every week to Sir Hudson Lowe. These reports fill the greater part of vol. 20,156 of the *Lowe Papers*. Of the two sources of information, the health reports written on the spot must, I think, be regarded as of greater value than the evidence contained in the *Voice from St. Helena*, which was written for the public as a complete vindication of O'Meara's conduct, after the death of Napoleon had put an end, in large measure, to the storm and strife which surrounded him. Then I must ask you to remember that O'Meara has been accused of being sadly wanting in historical accuracy. Long before he left St. Helena he became the most uncompromising and vindictive opponent of the British authorities and their policy as directed by Sir Hudson Lowe, and many experts refuse to give credence to his statements unless supported by corroborative testimony. But in this matter of medical evidence it is not contended that O'Meara has deliberately falsified facts; all that is asked is that the examination of his evidence shall proceed with caution, on account of his reputation as a witness and his avowed animosity to Sir Hudson Lowe and his policy. For these

reasons it will be necessary to check O'Meara's facts, and to compare the evidence in the *Voice from St. Helena* with his original health reports in the *Lowe Papers*.

After O'Meara's departure from St. Helena at the end of July 1818, no medical man saw Napoleon professionally until January 17, 1819, when Mr. Stokoe, the surgeon of H.M.S. *Conqueror*, was hastily summoned to attend Napoleon, who had been suddenly seized with an attack of vertigo and syncope. Stokoe saw Napoleon five times, and then his visits were ordered to cease. An excellent account of his brief association with Napoleon can be read in *Napoléon Prisonnier*, by M. Paul Frémeaux. Stokoe's testimony is not open to the charge of want of veracity, and may be accepted as a true account of his view of the illness.

After the enforced retirement of Stokoe from the case, Napoleon was again left without any professional assistance until September 23, 1819, when Francesco Antommarchi, who had been sent out to St. Helena as physician to the Emperor, paid his first visit to the patient. Antommarchi remained with Napoleon to the end, and during the last thirty-five days of the illness he was associated in the treatment with Dr. Archibald Arnott, the surgeon to the 20th Regiment. The evidence of Antommarchi is contained in his well-known book, *Les Derniers Moments de Napoléon*, published in 1825, and therefore after the death of the Emperor. In the examination of the testimony of Antommarchi, the greatest caution and reserve must be exercised, for what has just been said about O'Meara applies with added force with respect to Antommarchi. The book abounds with errors and false statements, and there can be no doubt that many of them were made by design. Unfortunately, the parts of his diary which deal with Napoleon's illness cannot be submitted to the test of any collateral evidence, for no other medical man saw the patient, if we except Arnott's attendance during the last thirty-five days, but where he deals with matters within the knowledge of other witnesses his mendacity is only too apparent. Indeed, of all the first-hand evidence relating to the captivity, Antommarchi's is the least reliable, and must, therefore, be scrutinized with the greatest care.

Arnott published in 1822 a pamphlet giving an account of the last thirty-five days of the Emperor's illness; and the opinions he formed during that period are recorded day by day in vol. 20,157 of the *Lowe Papers*. The two accounts differ materially, and, of course, more weight will be attached to the reports made at the time than to the considered statements in the pamphlet written after the death of Napoleon.

Having then briefly indicated the nature of the medical testimony at your disposal, and having drawn your attention to the question of the veracity of some of it, I propose now to lay before you an account of the illness of the Emperor as it is disclosed in the records available.

The first evidence I offer for your consideration is that of Barry O'Meara, who landed in St. Helena with Napoleon on October 17, 1815, and remained in professional attendance until July 25, 1818. We will

take the evidence in his book, the *Voice from St. Helena*, first, and deal with the health reports in the *Lowe Papers* afterwards. The references to ill health in the *Voice* may be divided into two periods; one dating from October 17, 1815, to September 30, 1817, and the other from October 1, 1817, to July 25, 1818. During the first period, O'Meara makes some thirty-seven allusions to Napoleon's ill health, but he does not mention indisposition until May 14, 1816, so it may be assumed that Napoleon was well until that date. All the references in this period deal with ailments which may be described with fairness as 'trifling'; and although these attacks sometimes lasted for a few days, they were never so serious that they altered the Emperor's particular mode of living at that time.

During this first period what was the nature of these attacks? The first one noticed by O'Meara was catarrhal, produced, he says, by walking out in thin shoes in the wet. Then attacks of headache of a nervous type are recorded on about fourteen occasions, and both Napoleon and O'Meara attributed them to want of exercise, for, at this time, the prisoner maintained a strict seclusion, and often did not go out of the house for weeks at a time. On July 26, 1816, there is a note of a slight pain in the right side, for which O'Meara recommended rubbing. On October 1, of the same year, carious teeth began to give trouble, and on the 23rd one cheek became swollen and painful, and the gums were spongy. In this condition the Emperor went out for a drive, the first one for six weeks, and on his return at 5 p.m. he was seized with shiverings and rigors, which O'Meara found to be due to an attack of tonsillitis, and it was not until November 7 that the surgeon could pronounce his patient well.

The months of December 1816 and January and February of 1817 contained no reference to ill health, with the exception of attacks of headache, but on March 24 slight swelling of the legs is recorded, a condition which had been remarked once before in the preceding November. April and May produced nothing of importance, but towards the end of that month the state of the teeth again produced inflammatory trouble in the right cheek, and these symptoms recurred in June and September. In the middle of September 1817 O'Meara informed Lowe that, with the exception of slight catarrhal attacks, Napoleon's health had been tolerable, and that his illness was not of a serious nature.

So for the first period there is very little in O'Meara's records to point with any certainty to the inception of a serious malady. If this be true of the first period, it is, however, equally certain that the second, which began at the end of September 1817, was ushered in by symptoms which gave great cause for uneasiness in the mind of O'Meara, for on September 30, 1817, Napoleon, who had been far from well for some days, was attacked with illness, the symptoms of which were quite definite, and persisted with but slight intermission to the end of O'Meara's stay on the Island.

These definite symptoms may be summarized. They were—(1) a dull pain in the right hypochondriac region ; (2) a sensation akin to numbness in the right scapular region ; (3) a pulse of 68 ; (4) spongy gums ; (5) nausea ; (6) a slight cough ; (7) feverish attacks ending in abundant sudoresis ; (8) headache ; (9) palpitation ; (10) œdema of the legs ; (11) general weakness. O'Meara examined his patient on October 3, and stated that the right side was firmer to the touch than the left, and that there was a tumefaction evident to the sight in that region, which when pressed gave a sensation of pain. The diagnosis was, that if these symptoms increased there would be no doubt that the disease was hepatitis.

From October 1, 1817, to July 25, 1818, the date on which O'Meara last saw Napoleon, these symptoms continued with varying intensity, and they were never entirely absent. During all the time the Emperor's health was bad he showed more and more disinclination to exert himself, and when recommended to take exercise, obstinately sheltered himself behind the excuse that the restriction of limits imposed upon him rendered such an action impossible. O'Meara saw Napoleon for the last time on July 25, 1818, and reported that he found him in much the same condition of ill health that had become habitual since the onset of the symptoms noted above.

In considering these statements made in the *Voice from St. Helena*, I must draw your attention to the fact that up to the end of the first period of ill health, O'Meara was on fairly good terms with Sir Hudson Lowe ; but by the time the graver symptoms made their appearance, the quarrel which had been brewing between Lowe and O'Meara became acute, and I think it may be fairly urged that the tone of his narrative becomes more coloured with his enmity towards Lowe just at the time when Napoleon became seriously unwell. Indeed, the last 150 pages of the second volume of the *Voice*, which deal with the second phase of Napoleon's illness, are so unmistakably devoted to an attack upon Lowe, that their value as an unvarnished medical testimony is largely destroyed.

Having given in outline the main features of O'Meara's account of Napoleon's illness as set forth in the *Voice from St. Helena*, let me direct your attention to his health reports written from week to week, and preserved in the *Lowe Papers*, vol. 20, 156. These reports are simple statements of the symptoms and progress of Napoleon's malady. Unlike the *Voice from St. Helena*, they are not designed to justify O'Meara's conduct, but were merely written to acquaint Sir Hudson Lowe with the state of the health of his prisoner. Therefore, because they are unmixed with contentious matter, they are more reliable than the reports in O'Meara's book.

The first report is dated October 20, 1816, that is five months after Napoleon had been in indifferent health, according to the *Voice*, and they continue every week with but few intermissions until October 9, 1817. But at this time difficulties arose concerning the reports, and

Napoleon refused to see O'Meara professionally so long as he made written reports to Sir Hudson. A compromise was, however, effected by Lowe agreeing to accept reports from Dr. Baxter, the principal medical officer, on the understanding that they were based on the verbal reports of O'Meara. Thereafter, until the departure of O'Meara, the reports were written by Dr. Baxter.

In these reports the record of symptoms is practically the same as that found in the *Voice from St. Helena*, but it can be stated with truth that the causes of the indisposition and the deductions made differ somewhat from those detailed in the book. All through the health reports O'Meara is careful to insist that Napoleon's mode of life is largely responsible for his ill health; for instance, he speaks of 'total lack of exercise', of Napoleon's being 'closely shut up in his room with windows fastened for days and even weeks', and of the refractory nature of the patient. In one report he says: 'By timely measures, I have no doubt he would soon be restored to health, but he will not do as he is advised.' Then the *Voice from St. Helena* mentions frequent nervous headaches, but the health reports tell us that Napoleon informed O'Meara that they were nothing new, for he had suffered from them frequently for some years before he came to St. Helena. Both reports mention the œdema of the legs, but Gourgaud is responsible for the statement that this had been a condition with Napoleon ever since the Russian campaign. Then I think it may be said that the account of the febrile manifestations, attended with abundant sweating, loses some of its intensity in the health reports. Lastly, there is Gourgaud's statement to Mr. Goulburn in London, in which he asserted that up to the time of his departure from St. Helena, in January 1818, Napoleon's bodily health had not been worse than it had been for some time previous to his arrival in the Island, and he based this statement on an intimate knowledge of the Emperor's habits of life.

But there are still other documents in existence from the pen of O'Meara which throw some light on the question. While he was compiling his journal and while he was writing his official weekly reports of Napoleon's health, he was busily engaged in a correspondence with his friend Mr. John Finlaison, the keeper of the records of the Admiralty. Copies of these letters fill two volumes of the *Lowe Papers*, and they exhibit O'Meara as a delightful correspondent, whose chief aim was to tell his friend everything of interest that was taking place at Longwood. So interesting are these letters that it is astonishing that no editor has ever considered their publication, for without doubt they would enhance O'Meara's reputation as a writer. In the Finlaison letters he does not say a great deal concerning Napoleon's illness, and when he does he attributes it rather to his invincible determination to live a life devoid of exercise, and calculated to break most of the ordinary laws of health.

When O'Meara left St. Helena, Dr. Verling, the surgeon to the Royal Artillery, and a man of considerable education, was appointed, by

Lowe, physician to Longwood. But the appointment was a complete sinecure, and need never have been made, for Napoleon adhered to his refusal to receive him, and during the whole time he was in residence Verling had no professional intercourse with the Emperor.

Before the departure of O'Meara, Drs. Baxter and Verling requested him to show those parts of his journal which related to Napoleon's health. But this he flatly refused on the grounds of professional etiquette. He, however, volunteered to make out an account of the case for the use of Verling. Those parts of the diary which deal with the illness may exist among O'Meara's papers in America, just as they appear in the *Voice from St. Helena*, but they have never seen the light, and Forsyth and others have even doubted whether they exist at all. Indeed, in the editorial commentary attached to the unpublished portions of O'Meara's original diary, which appeared in the *Century Magazine*, February-April 1900, we are told that the manuscript ceases in the early part of 1817—in fact, before Napoleon became seriously ill. The proceeding was rather suspicious, for O'Meara and Verling were on fairly friendly terms.

From July 25, 1818, to January 17, 1819, Napoleon was not seen by any medical man; he was in very strict seclusion, and hardly ever went out of doors. On January 17, Dr. John Stokoe was hastily summoned to the Emperor, who had been seized with an attack of vertigo which culminated in unconsciousness. Stokoe tells us that he found Napoleon suffering from very much the same symptoms that O'Meara had described, so it is reasonable to infer that very little change had taken place in his condition. Stokoe's visits were ordered to cease in three days, and his statements regarding the symptoms of the illness were, most unjustly, treated as untrue, or at all events as exaggerated. The testimony of Stokoe is open to one objection only. O'Meara had been on friendly terms with him, had introduced him to Napoleon, and had extracted a half promise from the Emperor that he would call in Stokoe, if in need of medical assistance. He was weak and pliable, and it is within the realm of probability that O'Meara's views became grafted on to those of Stokoe.

After the compulsory retirement of Stokoe, Napoleon was again without the assistance of a doctor, until Antommarchi paid his first professional visit on September 23, 1819. He deals more fully than any other medical writer with the symptoms and progress of the Napoleonic malady, and one could wish that the statements in his book were less open to the flat accusation of untruthfulness. But from first to last the book bristles with inaccuracies, and of all the testimonies of eyewitnesses of the St. Helena period, is perhaps the only one which has failed to find an authority who would accept without proof the statements contained therein. This is much to be regretted, for Antommarchi was an accomplished anatomist and a skilled pathologist, and could his word be relied on his testimony would be of inestimable value in solving the riddle of the Emperor's disease.

Before Antommarchi sailed for St. Helena he was in close touch with O'Meara, and became fully acquainted with his views regarding Napoleon's malady.

At his first professional visit, on September 23, 1819 Antommarchi made a careful examination and found the Emperor with a coated tongue, a pulse of 60, a dry cough attended with viscid expectoration, and on palpation he found the region over the left lobe of the liver very tender. Napoleon told him that he suffered from more or less constant dull pain in the right hypochondrium, and a pain in the right breast and shoulder. He also complained of nausea, the vomiting of bitter bilious matters, and nightly profuse perspirations. In fact the symptoms and signs were much the same as those described by O'Meara, and the Emperor, confined as he had been to his narrow and stuffy rooms for two years with frequent recourse to hot baths, presented a sad spectacle of enervated health and flabbiness of fibre.

Antommarchi at once set himself the difficult task of attempting to break down the invincible repugnance of his patient to take exercise in the open air. At first he was unsuccessful, but in a few days Napoleon consented to take his advice, and during the month of October 1819 he was out nearly every day. He was in a most feeble state, but little by little the effect of the fresh air began to show itself, and by the end of the month Antommarchi was able to describe Napoleon as well. The symptoms returned, however, on November 11, and lasted a week, and another relapse occurred on December 17, but was recovered from on December 21. The intervals between the attacks were becoming longer, and the duration of the seizures shorter, and after this no further attack took place until July 20, 1820, an interval of seven months. This was the time when Napoleon took up gardening, when he was well and out of doors every day, and was apparently free from cares and vexations.

Antommarchi had done an immense service to Napoleon; he had succeeded where O'Meara had failed, and had persuaded the Emperor to live a reasonably healthy life. The result was a large measure of improved health. Now it is a peculiar fact that during this period from September 23, 1819, to July 20, 1820, Antommarchi, when describing Napoleon's symptoms, makes no mention, except on October 24, of those of fever which were such a marked feature in O'Meara's reports. He does not mention the abundant perspirations until July 20, nor does he draw attention to the increased heat of the body, the rapidity of the pulse, and the shivering fits. He, however, speaks much of the headache, and the abdominal discomfort. It may, therefore, be inferred that these symptoms were not prominent during this period.

The attack in July lasted for about ten days, and there is little to record until September 18, 1820, when Napoleon again became unwell. About this time symptoms began to make their appearance which pointed unmistakably to serious disease in the alimentary tract. Indeed, the character of the illness completely changed and, from this date to the end,

the case became one of comparative simplicity. It is true there were intervals in which all the symptoms lost a considerable part of their intensity, but the sum total of Napoleon's condition during the last period of his illness was steady progression to a fatal termination.

What were these definite symptoms which stamped the illness as one belonging especially to the alimentary tract? The most persistent one was vomiting, and this condition was never absent for many days. Next to that in frequency came a disordered state of the bowels. Sometimes there was constipation and sometimes diarrhœa. Then there was considerable abdominal discomfort, evidenced by gaseous distension, colic, heaviness, and pain in various regions of the abdomen, but most commonly situated in the epigastrium and the right hypochondrium. Added to these manifestations were a steady progressive weakness, icy coldness of the extremities, and, from time to time, exacerbations of fever which always ended in abundant sweating. These were the most prominent symptoms during the last seven months of Napoleon's existence. As time went on all of them became more and more pronounced, and the vomiting especially became incessant. The fever also rose in intensity, and the weakness and wasting made rapid strides. Under the weight of these grave phenomena Napoleon's strength gradually sank. By the end of March 1821 the case was hopeless, but he lingered on, becoming steadily worse, until May 5, 1821, when he died at eleven minutes to six in the evening.

On April 1, Dr. Arnott, the surgeon to the 20th Regiment, was called in, and remained in attendance until the end. At first he was sceptical as to the serious nature of the illness, and was inclined to the opinion that most of the symptoms pointed to hypochondriasis, but towards the end he saw reason to alter his view, and when, on April 27, the matters thrown off the stomach were seen to be of 'coffee ground' consistence, he no longer doubted that serious disease of the stomach was at the root of Napoleon's indisposition.

It may be stated, therefore, that, soon after the middle of September 1820, the illness of the Emperor took on a new phase, and that, from that time, the symptoms pointed to the onset of grave gastric disease, very different from the indisposition from which he had suffered for the previous three years. This change in the symptoms may, I think, be fairly attributed to the beginning of the cancer of the stomach which eventually caused his death. It was one of those rapid-growing carcinomas which, when they attack the body of the stomach, generally result in a fatal termination in six or eight months.

The post-mortem examination of Napoleon now claims your investigation. This took place on May 6, in the drawing-room at Longwood, a little after 2 p.m. It was not a prolonged examination, for Sir Thomas Reade, who represented Sir Hudson Lowe, wrote to him on that day, and dated his letter 4 p.m. In the letter he informs Lowe that the examination is finished, and that Dr. Shortt has already left Longwood to give

Sir Hudson a verbal account of the proceedings. Therefore, allowing for the time it would take to sew up the body, a proceeding Sir Thomas required to be done before he left the room, the examination lasted about an hour and a half, and was performed in daylight.

Seven British doctors were present, viz. Shortt, Arnott, Burton, Mitchell, Livingstone, Henry, and Rutledge; and Antommarchi was the operator. Three accounts of the results of the examination are in existence—the official one, Antommarchi's, and Henry's—while Rutledge and Shortt have left brief statements of the appearances noticed. Antommarchi's is without doubt the fullest and the best, and proves the reputation he claimed as a pathologist. It will not be necessary to quote in detail the results of the examination, for they are well known, and can be read in Antommarchi's book and in the *Lowe Papers*, but attention will be confined to the chief appearances exhibited, and to the points wherein the accounts differ.

In one important particular all the reports are in complete agreement, and that is the stomach. This organ was found to be the seat of extensive carcinoma in a state of ulceration which, with the exceptions of about an inch around the cardiac orifice and a small portion along the greater curvature, involved practically the whole organ. Then all accounts agree in stating that adhesions existed uniting the stomach along its lesser curvature to the concave under-surface of the left lobe of the liver. There is no dispute concerning these facts, and they may be taken as true.

When, however, the question of the state of the liver and its capsule comes under consideration, we plunge at once into contradiction, obscurity, and doubt. But this can be only expected, for the state of the liver would decide once and for all time whether the contentions of the Longwood household or those of the British authorities were to prevail.

What have the doctors who were present at the post-mortem examination told us about the state of the liver and its capsule? Antommarchi informs us in his book that 'the spleen and the liver, which was hardened, were very large and distended with blood. The tissue of the liver, which was reddish-brown in colour, did not, however, present any other notable alteration in structure. The liver, which was affected with chronic hepatitis, was closely united by its convex surface to the diaphragm; the adhesion extended over the whole organ, and was strong, cellular; and of long standing.' The seeming contradiction between the statement that 'the liver did not present any notable alteration in structure', and that 'it was affected with chronic hepatitis', will be noticed. Then at the autopsy, Antommarchi, when he had cut into the liver, remarked to Sir Thomas Reade: 'It is good, perfectly sound, and nothing extraordinary about it except that it is a large liver.' Again, when the official report was read over to him by Shortt and Burton, Antommarchi expressed himself in complete agreement with its findings. These discrepancies must, therefore, be remembered when assessing the value of Antommarchi's testimony.

All the other doctors present, with the exception of Dr. Shortt, asserted that the liver was normal in size and structure. Shortt, however, thought the liver was enlarged, although he was satisfied as to its soundness.

The adhesion of the convex surface of the liver to the diaphragm is also a subject which gave rise to much divergence of opinion. Antommarchi, as we have seen, said it extended over the whole organ, and was strong, cellular, and of long standing. If this be a correct description, it is of course strong evidence of inflammatory trouble having attacked the liver at some time or other. But the official report says the adhesion was between the convex surface of the left lobe only and the diaphragm ; and adds, ' with the exception of the adhesions occasioned by the disease of the stomach, no unhealthy appearance presented itself in the liver.' Henry also, in his account, speaks of a small adhesion to the surface of the left lobe of the liver, which appeared to be a continuation and a consequence of the adjoining adhesions between the liver and the stomach. But the most direct contradiction of Antommarchi's statement concerning the adhesions between the diaphragm and the liver comes from Rutledge, who wrote a letter soon after the appearance of Antommarchi's book. Rutledge quotes Antommarchi's statement, and then says : ' There was no adhesion between the liver and the diaphragm, except through the medium of a little coagulable lymph, which I easily removed with my finger when taking out the liver for examination.'

This is all very perplexing, and in order that you may compare with greater ease the various statements made by different witnesses concerning the liver, I have placed the evidence together, and must leave you to draw your conclusions therefrom (see Appendix I).

There are several other points in the results of the post-mortem examination which require notice. Antommarchi mentions that he found the peritoneal membrane lined with a soft, diffuent transparent exudation. He also says, ' I observed on the peritoneal surface of the intestines and in its folds small spots and patches of a very light red colour, of various sizes, and disseminated. The mucous membrane of the digestive canal appeared to be in a healthy state.' Henry's report and the official document say that the intestines were sound. Then Antommarchi mentions the presence of tubercles and some small tuberculous excavations at the apex of the left lung, and he also describes the lymphatic glands of the small omentum as being tumefied and scirrhus, and some in a state of suppuration. The bronchial glands, and those of the mediastinum, were found by Antommarchi to be slightly enlarged, almost degenerated, and in a state of suppuration. But the condition of the bronchial glands, the lymphatic glands of the omentum, and the presence of obsolete tuberculous excavations at the apex of the left lung, are not mentioned by any of the other doctors who attended the post-mortem examination, and therefore rest on the assertion of Antommarchi alone. Finally, it remains to be said that Henry took notes of the appearances exhibited during the progress of the examination, and Dr. Graves of Dublin has

stated that his cousin, Dr. Burton, did the same. These notes of Dr. Burton are at present undiscoverable, but from what Sir Thomas Reade has told us in his report, we may assume that they did not favour the hepatitis theory. Whether Antommarchi took notes as he performed the examination is unknown, but having in view the fact that he was the operator, and that the examination did not last much longer than an hour and a half, it may be doubted if he could have had time to do both.

An account has now been given of the symptoms of Napoleon's illness, and of the appearances found at the post-mortem examination, and it becomes our duty to consider the deductions which have been drawn by various authorities from these facts. All are, I think, agreed that the ultimate cause of death was cancer of the stomach. Indeed, with the uncontradicted statement before us, attested by all present at the post-mortem examination, that nearly the whole of the stomach was in a state of ulceration, and in view of the undisputed facts that for weeks before his death Napoleon had been unable to retain anything for long on his stomach, suffered from incessant vomiting, and presented other symptoms of serious disease of the stomach, no other conclusion appears possible. Surely the fact that nearly the whole of the internal surface of the stomach was converted into a huge cancerous ulcer may be regarded as sufficient to cause the death of a man.

It is true that Héreau, in 1829, and later Boudoin, have sought to prove that the supposed cancer was nothing more than an inflammatory condition, but I have the weight of the authority of Professor Arthur Keith, who tells me that no one who reads over Antommarchi's careful description of the post-mortem appearances of the stomach could come to any other conclusion than that the disease of the stomach was cancer. In support of that statement he quoted the opinion of the eminent pathologist Mr. Shattock, who, after reading over Antommarchi's account, came to the conclusion that the disease of the stomach there described was cancer and cancer alone. Indeed, higher opinions than these would be difficult to find. I mention this particularly because I have heard it stated that Professor Keith does not believe that Napoleon had cancer of the stomach.

But if there appears to be little doubt that the ultimate cause of Napoleon's death was cancer of the stomach, there are still the symptoms from which he suffered during life to be considered, some of which are not in accordance with those of gastric cancer. Indeed, as has already been pointed out, there is considerable difficulty in regarding the symptoms of the illness during the whole period of Napoleon's ill health as due to cancer alone. For, on that supposition it would make the duration of the cancer far too long, and it was only some eight months before death that definite symptoms pointing to gastric cancer began to make their appearance. Many explanations have been offered to account for these discrepancies, the most usual being hepatitis, and having regard to the symptoms during the earlier part of the illness, the diagnosis is by no

means unreasonable. But if hepatitis existed for three and a half years, surely undoubted evidence of that condition would have been disclosed at the post-mortem examination, either in the liver itself or its capsule. But, as I have pointed out to you, there is a direct conflict of evidence on this point. Antommarchi alone describes the liver as being affected with chronic hepatitis, although, in a sentence just before, he states that it exhibited no alteration in structure. Antommarchi alone tells us that the adhesions between the liver and the diaphragm extended over the whole organ, and were strong, cellular, and of long existence. All the others present at the post-mortem examination assert that the liver was sound, and that a small adhesion only was found between the liver and the diaphragm; while Rutledge roundly accuses Antommarchi of mendacity, and affirms that there was an adhesion between the liver and the diaphragm produced only through the medium of a little coagulable lymph, which he easily removed with his finger. Then there is the letter of Dr. Burton, in which he says that Antommarchi expressed agreement with the official report, but refused to sign it on the advice of Count Bertrand.

In deciding the actual state of the liver and its capsule, the credibility of the witnesses is all-important. Do you believe Antommarchi, the undoubtedly capable pathologist, the man who published the anatomical plates of his master Mascagni as his own; the man who stole the mask of Napoleon from the owner, Dr. Burton (who executed the work after Antommarchi had failed), and then asked the world to believe that it was his and his alone; the man who, in his book, inserts long conversations with Napoleon, on days when it was known that the Emperor refused to allow him in his presence; and the man whose book, beyond all others dealing with the period, has been found sadly wanting when weighed in the balances of historical accuracy? Or, do you believe the seven British doctors who witnessed the post-mortem examination, men with no particular claim to pathological knowledge; men one and all fearful lest an expression of opinion contrary to the British view might seriously compromise their positions, and destroy their chances of promotion; men dominated, it is true, by the narrow-minded policy of Sir Hudson Lowe, but also men against whom no charge of deliberate falsification of facts has ever been brought? Motives for stating certain facts will not help us, for both Antommarchi and the seven British doctors were biased, the former to support the climatic contentions of the Frenchmen, the latter in support of the British authorities with their negation of any climatic influences whatsoever. It is, in fact, Hume's contest between two opposite improbabilities, and must be decided by the method advocated by him.

Another theory, to account for the symptoms before the definite ones of gastric cancer, is that which attributes them to the presence of a chronic gastric ulcer. This theory has often been advanced, and has the support of Professor Ewald, Sir Lauder Brunton, and other authorities. There

is much to be said for this view. The pain, its situation and character, together with other symptoms described during the course of the illness, make it a possible hypothesis. But this theory like all others does not account completely for all the symptoms noticed, yet it is one which deserves your attention, when considering the whole subject.

But another theory has been advanced lately to account for the symptoms from which Napoleon suffered during the first three years of his illness. Early this year a most important contribution to the study of this subject came from the able pen of Professor Arthur Keith. In a lecture which he delivered before the Hunterian Society, he propounded the view that Napoleon's indisposition was due to an endemic form of disease dependent upon particular climatic conditions present on the Island of St. Helena. He rested his thesis on two main premisses. The first premiss was based on his contention that two specimens of small intestine exhibited in the Museum of the Royal College of Surgeons, and described, 'Incipient Fungus of the Glands of the Small Intestine, Napoleon, Barry O'Meara to Sir Astley Cooper,' did, in fact, come from the body of the Emperor. On submitting these specimens to microscopic examination, Professor Keith found that the so-called incipient fungus was not cancer at all, but inflammatory in nature, and, indeed, what one would expect to find in a man who had been affected for a long period with chronic undulant fever.

His second premiss was based on the contention that during the three and a half years that Napoleon was ill, the symptoms exhibited corresponded in the main to those of undulant fever, a condition which would have produced the appearances found in the specimens of the small intestines in the Museum of the Royal College of Surgeons.

In support of the first premiss, Dr. Keith contended :

1. That Barry O'Meara obtained the specimens from Antommarchi, who surreptitiously abstracted them from the body of Napoleon, either during, or after, the post-mortem.

2. That Sir Astley Cooper was far too shrewd a man of the world to label these specimens as coming from the body of Napoleon, without satisfying himself that such was really the case.

3. That Antommarchi in his post-mortem report did incidentally describe the very appearances that these enlarged glands of the small intestine would exhibit when viewed from the external or peritoneal surface of the intestine ; for he said : ' In the peritoneal surface, and in the folds of peritoneum, I observed small spots and patches of a pale red colour, of various sizes and disseminated. The mucous membrane of this canal appeared to be in a sound state.'

Now the evidence produced by Dr. Keith in support of his first contention is admittedly circumstantial in character, for there is no written evidence, and no verbal statement handed down, so far as is at present known, which suggest that Antommarchi abstracted the specimens of small intestine from the body of Napoleon. The same may be said also

of the contention that the specimens were handed to O'Meara by the Corsican pathologist. It is, in fact, a theory of probabilities, and must be decided by the usual methods adopted in such cases, of weighing the evidence for and against the theory, and rejecting that which is most improbable.

In order to enable you to arrive at a solution of this question, it will be necessary to state the evidence in existence which to a certain extent conflicts with the contention of Dr. Keith, and which he himself has stated with admirable clearness. In the first place, none of the reports of the post-mortem examination mention any apparent disease of the intestines, and Antommarchi in particular says that the intestines appeared to be healthy. In addition, in a letter to Count Montholon written before he published his book, he says the intestines were sound. Then his observation concerning the appearance of small pale red spots and patches in the peritoneal lining of the intestines may be read in conjunction with his statement that 'a soft, diffuent and transparent exudation lined the whole extent of the contiguous part of the internal surface of the peritoneum', and the question may be asked with fairness, whether those small pale red patches and spots may not have been patches of hyperæmia, which are by no means uncommon when peritonitis has been present.

Then there can be no doubt that the most rigid precautions were observed to prevent the abstraction of any parts from the cadaver. As already stated, the post-mortem examination was finished before 4 p.m., and therefore took place in broad daylight. The orders of Sir Hudson Lowe to Sir Thomas Reade, who represented him at the examination, were positive and explicit, to the effect that no abstraction of the parts was to be permitted, and that care was to be taken not to allow the cavities to be opened a second time. How did Reade perform his duty? In vol. 20, 133, f. 133 of the *Lowe Papers* is to be found his exhaustive report of what took place at the post-mortem examination, and in it he describes minutely the precautions he took. After the examination was finished, he says: 'I desired Dr. Shortt to give directions for the body being sewed up, and I requested it might be done previous to my leaving the room.' This was done, and then Reade continues: 'The heart was given in charge to Assistant-Surgeon Rutledge of the 20th Regiment, who was placed in charge of the corpse, and to whom I gave the most pointed orders that he was not to allow it out of his sight.' Seven British doctors and three combatant British officers, none of them very friendly to Antommarchi, the operator, were closely watching his movements, and two of the British doctors, Henry and Burton, were taking notes of the appearances exhibited as the examination proceeded. Rutledge, in vol. 20, 133, f. 159 of the *Lowe Papers*, strongly dissents from Antommarchi's statement that the British doctors attended *ex officio*, and says: 'From the very moment that the examination of the body commenced, all took a sufficiently active part to satisfy ourselves [*sic*]

as to the nature of the disease.' It does, therefore, seem that extraordinary precautions were taken to prevent the surreptitious abstraction of parts from the body of the dead Emperor.

After the post-mortem examination, the body of Napoleon was sewn up before Sir Thomas Reade left the room, it was then dressed and laid on the historic camp bed, with Assistant-Surgeon Rutledge in constant attendance all through the night of May 6. Rutledge has left a minute account of what took place during what he is pleased to call his 'visitations at Longwood' (*Lowe Papers*, vol. 20, 133, f. 150). He tells us how he watched the body all the night, and how on the following evening of May 7, at 7 p.m., he saw the body finally soldered up in the coffin with the heart and stomach in separate vessels, and placed therein. Captain Crokatt, the orderly officer, also shared this vigil, and during the whole day of May 7 marshalled those who filed past the dead Emperor. Doubts have been expressed by some as to whether Rutledge or Arnott was in charge of the corpse, but the information in the *Lowe Papers* leaves no doubt that Rutledge was the person in charge, and in addition there is the testimony of one Abraham Millington, the armourer, who did the actual soldering to the coffin. He tells us that Dr. Rutledge was the British surgeon in charge when he closed the coffin up (see *The Military Gazette*, March 3, 1838). There is also other evidence that extraordinary precautions were taken, for Professor Keith has published a letter from Sir A. R. Simpson in which is related Arnott's share in the proceedings. Arnott was apparently so fearful lest the heart and stomach should be stolen, that he took them into his bedroom on the night of the 6th of May, placed them in the basin, and retired for the night provided with two loaded pistols under his pillow. During the night he was disturbed by a noise; it was not Antommarchi or Montholon, however, but rats which were attempting to take away the imperial heart and stomach. It may also be asked why, if Antommarchi had the specimens in his possession, he omitted to mention the fact in his book which was published several years after the death of Napoleon? He had nothing to fear, and the specimens, thought, as they then were, to exhibit secondary growths, would have strengthened further the contention he was concerned to prove, namely, that Napoleon died of a disease beyond the power of Antommarchi to cure. Again, attention must be paid to the reputations of the two main actors in the transaction, Antommarchi and O'Meara, and the question must be asked: Can you believe O'Meara without corroborative testimony? On the other hand, you must also take into consideration the contention of Dr. Keith, that Sir Astley Cooper, who was well known for his knowledge of the world, would be the last person to be imposed upon by any one; and, indeed, one would expect that he would take steps to assure himself that the specimens were, as far as he could determine, genuine. In any case, however, he could have obtained no better evidence than the assertions to that effect of O'Meara, and possibly Antommarchi.

But Professor Keith's thesis does not rest alone on the authenticity of the specimens in the Museum of the Royal College of Surgeons. Even if they were rejected as spurious, there still remains his second premiss, which is based on the contention that the clinical evidence strongly supports the theory that the symptoms exhibited by Napoleon during the course of his illness were in conformity with the view that he was suffering from an endemic form of fever produced by the climatic conditions existing in St. Helena. It is in this part of his argument that he has contributed so much to the study of the illness, and has thrown so much light on symptoms which were before obscure. It cannot be denied that some of the symptoms from which the Emperor suffered lend strong colour to the belief that some form of fever was present ; and further, that these symptoms masked those of cancer, which was responsible for his death ultimately. It was towards the end of the illness that the symptoms of febrile disturbances became so prominent, for until January 1821 these manifestations were moderate in their intensity. It is, therefore, an interesting study to inquire into the nature of these attacks, which appear to be due to some endemic cause. At the time they became so severe, Napoleon was within two months of the date of his death, and, as we know, the cancer was in a state of ulceration, and involved nearly the whole body of the organ. Now most writers on the subject say that the terminal stages of gastric cancer are apt to be attended with an elevation of the temperature. Fenwick has dealt with this point, and maintains that a third of the cases of gastric cancer exhibit rises of temperature. He also says that 58 per cent. of those cases in which the body of the stomach is involved show pyrexia. He describes the rise of temperature as being accompanied by chills, rigors, headaches, pains in the limbs, and the defervescence as being attended with profuse sweatings. It is, therefore, an interesting problem to determine how much of these febrile manifestations was due to the septic absorption going on from the ulcerated cancer, and how much to the endemic form of fever with which Napoleon was supposed to be affected.

But although this question may be debated when dealing with the later stages of the illness, it can afford no explanation of the same symptoms exhibited during the earlier stages, and there appears to be no other solution than the one offered by Professor Keith, namely, that Napoleon was affected with some form of endemic fever. In connexion with this the early history of Napoleon's life is most important, and Mr. Norwood Young, in his able and thoughtful book, *The Growth of Napoleon*, has demonstrated the fact that Napoleon when a young man was seriously attacked with 'ague'. In a letter quoted under date 1787 Napoleon says : ' I myself have been tormented for a month past by a tertian fever ; ' and during the greater part of a vacation which he was spending in Corsica at the time, he was apparently in poor health. Again, when at Auxonne in 1789, he writes : ' This neighbourhood is very unhealthy by reason of the adjoining marshes . . . I have had for certain periods of time a

continuous fever, which left me four days' repose, and then returned. It has weakened me, and has given me long periods of delirium.' So in early life Napoleon was affected with some form of malaria for a period of more than a year. Speaking of Ajaccio, Mr. Young mentions that malaria is prevalent, and that in summer the inhabitants migrate to the hills. There is, therefore, a clear history of infection of an endemic kind, prevalent in the islands of the Mediterranean ; and it is by no means impossible that the seeds thus sown may have flourished again when Napoleon went to reside in the sub-tropics of St. Helena.

Later in the career of the Emperor, another account has been given of an attack of illness which bore some resemblance to malaria. Ségur mentions in his classic, *La Campagne de Russie*, that Napoleon on the eve of the battle of Borodino was seized with an attack of fever, which lasted on and off for five days, and considerably interfered with his dispositions at that time.

In order to understand this question, attention must be paid to the climatic conditions subsisting in St. Helena, and the effect they had on those living there during the period of captivity. In few matters connected with this subject have such contradictory views been expressed, and in order to place before you the true position, I have made a study of the health returns of the regiments quartered in St. Helena at that time, and have also inquired into the state of health amongst those living at Longwood.

First, as to Longwood : Napoleon's household consisted of from forty to fifty people, and during the whole period of the captivity but two deaths are recorded, those of Napoleon and Cipriani. Cipriani, the *maître d'hôtel*, was suddenly seized with abdominal pain, and died, after five days' illness, with all the symptoms of general acute peritonitis. From time to time some of the inmates of Longwood were indisposed, and Gourgaud in particular had a sharp attack of dysentery soon after his arrival in St. Helena. But there does not appear to be any record of people at Longwood being attacked with symptoms similar to those from which the Emperor suffered. Then if, as it would be reasonable to infer, the milk and the water were sources of infection, it must in fairness be stated that Napoleon drank neither milk nor water except boiled with his coffee. It must also be remembered that the household at Longwood was strictly confined within limits, and its members rarely went outside those limits except for short periods. Therefore, if sources of infection existed at Longwood, one would expect to find evidences of it in a circumscribed community, but although there is no indication of this, yet it is possible that some of the indisposition mentioned from time to time may have been due to this cause.

The health of the Island generally, and particularly the health of the regiments quartered there, has an important bearing on this subject. The best guide to the health of the Island is to be found in the monthly returns of sickness and deaths amongst the troops stationed in St. Helena.

Now it is an extraordinary fact that during the whole period of the captivity no officer died on the Island, with the exceptions of Lieutenants Davy and Macdougall of the 66th, who were drowned while fishing, and the proportion of those who were granted sick leave is extremely small. In fact, the officers enjoyed excellent health, and their indisposition was as a rule of a trifling kind. When, however, the sickness and deaths of the rank and file are investigated, an appalling state of affairs is disclosed. I will not weary you with statistics, for they can be consulted in the Appendices II and III at the end of this paper, but I will epitomize the results of my investigations.

The average strength of the Foot Regiments quartered in St. Helena during the six years of the captivity was 1096, and every month there was an average of 71 men on the sick-list. The total number of deaths during the same period was 256, and the annual death-rate was, therefore, approximately 40 per thousand. In the 66th Regiment it rose as high as 63 per thousand, and was never below 23 per thousand, as in the case of the 53rd Regiment. It has been contended frequently that the high rate of illness amongst the troops was noticeable only when they were quartered at Jamestown and adjoining camps, places which were admittedly unhealthy ; but my investigations disclose no great difference between the mortality returns when the troops were stationed at Jamestown, and when quartered at Deadwood, within a mile of Longwood. How Surgeon Henry, in his *Events of a Military Life*, can assume that the sickness was not exceptional in the face of these facts passes all comprehension.

It has also been asserted that the high rate of mortality in the 66th was on account of the fact that the regiment had come straight from India, and was therefore in a debilitated condition. The mortality was 63 per thousand. But the 20th, another regiment in St. Helena, although coming straight from England, and although stationed at Deadwood, a healthy place, had an annual mortality of 53 per thousand. In order to be quite certain I have made a comparison between the regiments stationed respectively in St. Helena, India, and England. During the period under review, the annual death-rate was 65 per thousand for India, 16 per thousand for England, and 40 per thousand for St. Helena. It seems impossible, therefore, in face of these facts, to resist the conclusion that, for rank and file at any rate, St. Helena was an unhealthy climate. The diseases responsible for this high death-rate in St. Helena were : (1) dysentery and bowel complaints ; (2) liver complaints ; (3) effects of the sun ; and (4) chest complaints.

There is much, therefore, to be said for Professor Keith's 'endemic theory' ; and from a consideration of the evidence it appears to offer the only possible explanation of one set of symptoms which Napoleon exhibited.

The evidence regarding the malady of Napoleon has now been placed before you, I trust without prejudice, and without any attempt to press

any view unduly. I hope you are now in a position to answer the questions which I ventured to ask at the beginning of this paper, and which I repeat again :

1. What were the diseases from which Napoleon suffered ?
2. What were the probable causes of these maladies ?
3. How far did the results of the post-mortem examination substantiate the clinical evidence of those diseases ?

In the preparation of this paper the usual sources of information have been freely used and consulted, but particular mention may be made of the *Lowe Papers* in the British Museum, and the 'Monthly Returns' of Sickness and Deaths in Regiments in the Record Office. Much valuable matter has also been obtained from Mr. G. L. de St. M. Watson, and his book, *A Polish Exile with Napoleon*, has been of the greatest use. To him and to Mr. Norwood Young, who has been most helpful with criticism and information, my sincere thanks are due.

APPENDIX I

THE POST-MORTEM EXAMINATION OF NAPOLEON BONAPARTE.—THE EVIDENCE IN EXISTENCE CONCERNING THE STATE OF THE LIVER

ANTOMMARCHI'S ACCOUNT

The spleen and the liver, which was hardened, were very large and distended with blood.

The tissue of the liver, which was reddy-brown in colour, did not, however, present any other notable alteration in structure.

The liver, which was affected with chronic hepatitis, was closely united by its convex surface to the diaphragm ; the adhesion extended over the whole organ, and was strong, cellular, and of long standing. The concave surface of the left lobe of the liver adhered closely and firmly to the corresponding part of the stomach, especially along the small curve of that organ, and also to the little epiploon.

At every point of contact the lobe was sensibly thickened, swollen and hardened.

HENRY'S ACCOUNT

(*Lowe Papers*, vol. 20, 214, f. 200.)

No abscess, no hardness, no enlargement, no inflammation (of the liver) were observed. On the contrary, the liver was of natural size, and perfectly healthy in its internal parts.

There was a small adhesion of the convex surface of the left lobe to the diaphragm, which appeared to have been a continuation and a consequence of the adjoining adhesions between the liver and the stomach.

When the stomach was brought into view, an adhesion of great extent was perceived between its superior surface and the concave surface of the left lobe of the liver.

THE OFFICIAL REPORT

(Lowe Papers, vol. 20, 133.)

Strong adhesions connected the whole superior surface (of the stomach), particularly about the pyloric extremity, to the concave surface of the left lobe of the liver.

The convex surface of the left lobe of the liver adhered to the diaphragm, but with the exception of the adhesions occasioned by the disease of the stomach, no unhealthy appearance presented itself in the liver.

In the original draft of the Official Report occurred the words : ' The liver was perhaps a little larger than natural ' (*Lowe Papers*, vol. 20, 157, f. 20).

RUTLEDGE'S ACCOUNT

(Lowe Papers, vol. 20, 133, f. 139.)

There was no adhesion of the liver to the diaphragm, excepting through the medium of a little coagulable lymph, which I easily removed with my finger when taking out the liver for examination. The part of the left lobe of the liver which had been in contact with the cancerated part of the stomach was indurated, and there was a superficial thickening which extended to about one-fourth of an inch round the circumference of the cancer. The remainder of the left lobe was free from disease.

SIR THOMAS READE'S ACCOUNT

(Lowe Papers, vol. 20, 133, f. 133.)

The liver was afterwards examined. The moment the operator took it out, Dr. Shortt instantly observed, ' it was enlarged.' All the other medical gentlemen differed with him in this opinion, particularly Dr. Burton, who combated Dr. Shortt's opinion very earnestly. Dr. Henry was equally divided with Dr. Burton. Dr. Arnott said there was nothing extraordinary in the appearance of the liver ; ' it might probably be a large one, but certainly not larger than the liver of any man of the same age as General Bonaparte.' Dr. Mitchell said he saw nothing extraordinary, and Mr. Rutledge said it certainly was not enlarged, notwithstanding all these observations.

Dr. Shortt still persisted in saying ' it was enlarged '. This struck me so forcibly that I stepped forward and observed to the medical officers generally, that it appeared to me very important that they should all be prepared to give a decided and prompt opinion as to the real state of the liver, and I recommended a very careful examination of it. Dr. Shortt made no more observations, but all the other gentlemen reiterated their first opinion to me. At this moment the liver was in the hands of the operator, and upon my appearing desirous to see it close, he took his knife and cut it from one end to the other, observing to me : ' It is good, perfectly sound, and nothing extraordinary in it.' He observed at the same time that he thought it was a large liver. His opinion, however, did not appear to have been made in the same manner as Dr. Shortt had expressed it, viz. ' that the liver was enlarged.' There is a wide difference between ' a large liver ' and ' a liver being enlarged '. I made this observation to Dr. Burton and Dr. Arnott, who coincided.

ANTOMMARCHI'S STATEMENT, DR. BURTON'S LETTER

(Lowe Papers, vol. 20, 214.)

Dr. Shortt asked Antommarchi to add his signature to the official document giving the results of the post-mortem examination. Antommarchi replied that he agreed perfectly with the British medical officers, but that as the document was written in a language which he did not understand, it might appear strange if he annexed his signature to it. Dr. Shortt then offered to translate it into Italian, and Dr. Burton offered to do the same for him in French ; and as Count Bertrand understood English, the faithfulness of the translation could be verified. Antommarchi then had the Report translated, *with the correctness of which he expressed himself as quite satisfied*. He then asked Count Bertrand what he should do. The Count objected to Antommarchi signing the Report on the *sole ground* that in it the deceased was not designated 'the Emperor Napoleon'.

DR. THOMAS SHORTT'S ACCOUNT

(From unpublished documents among the Shortt Papers.)

On opening the body every part of it was sound excepting the stomach, which was a perfect mass of disease from cancer and ulcerated in several places. In one place near the lower opening there was a hole sufficiently large to admit the little finger, which penetrated the coats of the stomach. (Letter to his father, dated May 7, 1821.)

The original draft of the Report of the post-mortem examination is in the possession of the Shortt family, in Dr. Shortt's handwriting, and in it, after the word 'diaphragm', are the words : 'The liver was perhaps a little larger than natural.' This sentence is crossed out, and a footnote says : 'The words crossed out were suppressed by the order of Sir Hudson Lowe. (Signed) THOMAS SHORTT, P.M.O.'

APPENDIX II

TABLES SHOWING THE MORTALITY IN THE FOOT REGIMENTS
STATIONED IN ST. HELENA*(From the 'Monthly Returns' in the Record Office)*

FIFTY-THIRD, SIXTY-SIXTH, AND TWENTIETH REGIMENTS

COLLECTIVE RETURNS

Period under review : April, 1816, to March, 1822, inclusive ; 72 months, or 6 years.

Average strength of all regiments		1096
Deaths during the period under review		256
Deaths per annum		42
Death-rate per annum		40 <i>per thousand</i>
Average number of sick men per month, 71.		

For comparison :

REGIMENTS STATIONED IN ENGLAND

Average death-rate per annum, 16 *per thousand*.

REGIMENTS STATIONED IN INDIA

Average death-rate per annum, 65 *per thousand*.

FIFTY-THIRD REGIMENT

(2nd Battalion)

Where stationed : Deadwood.

Period under review : April, 1816, to June, 1817, inclusive ; 15 months.	
Average strength of the battalion	558
Deaths during the period under review	17
Deaths per annum	13
Death-rate per annum	23 <i>per thousand</i>
Average number of sick men per month, 38.	

For comparison :

FIFTY-THIRD REGIMENT

(2nd Battalion)

Where stationed : England.

Period under review : the year 1815.

Average strength	544
Deaths during the year	7
Death-rate per annum	11 <i>per thousand</i>
Average number of cases of sickness per month, 22.	

For comparison :

FIFTY-THIRD REGIMENT

Where stationed : Bangalore, India.

Period under review : the year 1821.

Average strength	806
Deaths for the year	36
Death-rate per annum	44 <i>per thousand</i>

SIXTY-SIXTH REGIMENT

(2nd Battalion).

Where stationed : Jamestown, possibly Francis Plain.

Period under review : April, 1816, to June, 1817, inclusive ; 15 months.	
Average strength of the battalion	603
Deaths during the period under review	48
Deaths per annum	38
Death-rate per annum	63 <i>per thousand</i>
Average number of sick men per month, 51.	

For comparison :

SIXTY-SIXTH REGIMENT

(1st Battalion)

Where stationed : North of England.

Period under review : the year 1822.

Average strength	483
Deaths during the year	4
Death-rate per annum	8 <i>per thousand</i>
Average number of cases of sickness per month, 24.	

For comparison :

SIXTY-SIXTH REGIMENT

(1st Battalion)

Where stationed : Dinapore, India.

Period under review : the year 1816.

Average strength	886
Deaths for the year	102
Death-rate per annum	115 <i>per thousand</i>

N.B.—During this year 35 men died of cholera ; if these are deducted the death-rate per annum is 75 *per thousand*.

SIXTY-SIXTH REGIMENT

(1st and 2nd Battalions)

Where stationed : Deadwood, Jamestown, and Francis Plain.

Period under review : July, 1817, to February, 1820, inclusive ; 32 months.

Average strength of the two battalions		956
Deaths during the period under review		93
Deaths per annum		36
Death-rate per annum		30 <i>per thousand</i>
Average number of sick men per month,	66.	

For comparison :

THIRTEENTH REGIMENT

Where stationed : Jersey.

Period under review : the year 1817.

Average strength		627
Deaths during the year		12
Death-rate per annum		19 <i>per thousand</i>
Average number of cases of sickness per month,	40.	

SIXTY-SIXTH REGIMENT

(1st Battalion)

Where stationed : Jamestown and Francis Plain.

Period under review : March, 1820, to May, 1821, inclusive ; 15 months.

Average strength of the battalion		622
Deaths during the period under review		23
Deaths per annum		18
Death-rate per annum		30 <i>per thousand</i>
Average number of sick men per month,	34.	

For comparison :

TENTH REGIMENT

Where stationed : England.

Period under review : the year 1823.

Average strength		501
Deaths for the year		12
Death-rate per annum		23 <i>per thousand</i>

For comparison :

SIXTY-SEVENTH REGIMENT

Where stationed : Meerut, India.

Period under review : the year 1816.

Average strength		888
Deaths during the year		42
Death-rate per annum		47 <i>per thousand</i>

TWENTIETH REGIMENT

Where stationed : Jamestown, Francis Plain, Lemon Valley.

Period under review : May, 1819, to February, 1820, inclusive ; 10 months.

Average strength of the regiment		595
Deaths during the period under review		27
Deaths per annum		32
Death-rate per annum		53 <i>per thousand</i>
Average number of sick men per month,	43.	

For comparison :

TWENTY-FOURTH REGIMENT

Where stationed : Dinapore, Calcutta

Period under review : the year 1817.

Average strength		896
Deaths during the year		62
Death-rate per annum		61 <i>per thousand</i>

TWENTIETH REGIMENT

Where stationed: Deadwood.

Period under review: March, 1820, to May, 1821, inclusive; 15 months.	
Average strength of the regiment	598
Deaths during the period under review	35
Deaths per annum	28
Death-rate per annum	50 <i>per thousand</i>
Average number of sick men per month, 33.	

For comparison:

SIXTY-FIFTH REGIMENT

Where stationed: Bombay.

Period under review: the year 1817.

Average strength	546
Deaths during the year	22
Death-rate per annum	40 <i>per thousand</i>

TWENTIETH REGIMENT

Where stationed: Francis Plain and Jamestown.

Period under review: June, 1821, to March, 1822, inclusive; 10 months.	
Average strength of the regiment	537
Deaths during the period under review	9
Deaths per annum	<i>approximately 11</i>
Death-rate per annum	20 <i>per thousand</i>
Average number of sick men per month, 23.	

For comparison:

TWENTIETH REGIMENT

Where stationed: Bombay.

Period under review: the year 1823.

Average strength	682
Deaths for the year	45
Death-rate per annum	66 <i>per thousand</i>

APPENDIX III

PROPORTION OF SICK DAYS AMONGST THE FOOT REGIMENTS
STATIONED IN ST. HELENA

From September 25, 1815, to December 31, 1821

(Record Office, Muster Rolls, W. O. 12)

FIFTY-THIRD, SIXTY-SIXTH, AND TWENTIETH REGIMENTS

COLLECTIVE RETURNS

The period under review, in days, was 2,287.
 The average strength on the island of these three regiments was 1,096.
 The total number of 'Troop Days' was, therefore, 2,506,552.
 The total number of 'Sick Days' was 121,203.
 Therefore, the percentage of 'Sick Days' was 4.75 (approximately).
 Average number of 'Sick Days' per man was 110.

FIFTY-THIRD REGIMENT

(2nd Battalion)

Where stationed: Deadwood.

Period under review: September 15, 1815, to June 24, 1817, or in days, 637.
 Average strength, 558.
 The total number of 'Troop Days' was, therefore, 355,446.
 The total number of 'Sick Days' was 13,284.
 Therefore, the percentage of 'Sick Days' was 3.75.
 Average number of 'Sick Days' per man was 24.

SIXTY-SIXTH REGIMENT

(1st Battalion)

Where stationed : Francis Plain and Deadwood.

Period under review : July 25, 1817, to March 24, 1821, or in days, 1,284.

Average strength, 622.

The total number of ' Troop Days ' was, therefore, 896,648.

The total number of ' Sick Days ' was 56,182.

Therefore, the percentage of ' Sick Days ' was 6.25 (approximately).

The average number of ' Sick Days ' per man was 91.

SIXTY-SIXTH REGIMENT

(2nd Battalion)

Where stationed : Jamestown.

Period under review : April 17, 1816, to July 24, 1817, or in days, 463.

Average strength, 603.

The total number of ' Troop Days ' was, therefore, 279,189.

The total number of ' Sick Days ' was 19,209.

Therefore, the percentage of ' Sick Days ' was 7 (approximately).

The average number of ' Sick Days ' per man was 32.

TWENTIETH REGIMENT

Where stationed : Jamestown, Francis Plain, Deadwood.

Period under review : March 24, 1819, to December 31, 1821, or in days, 1,012.

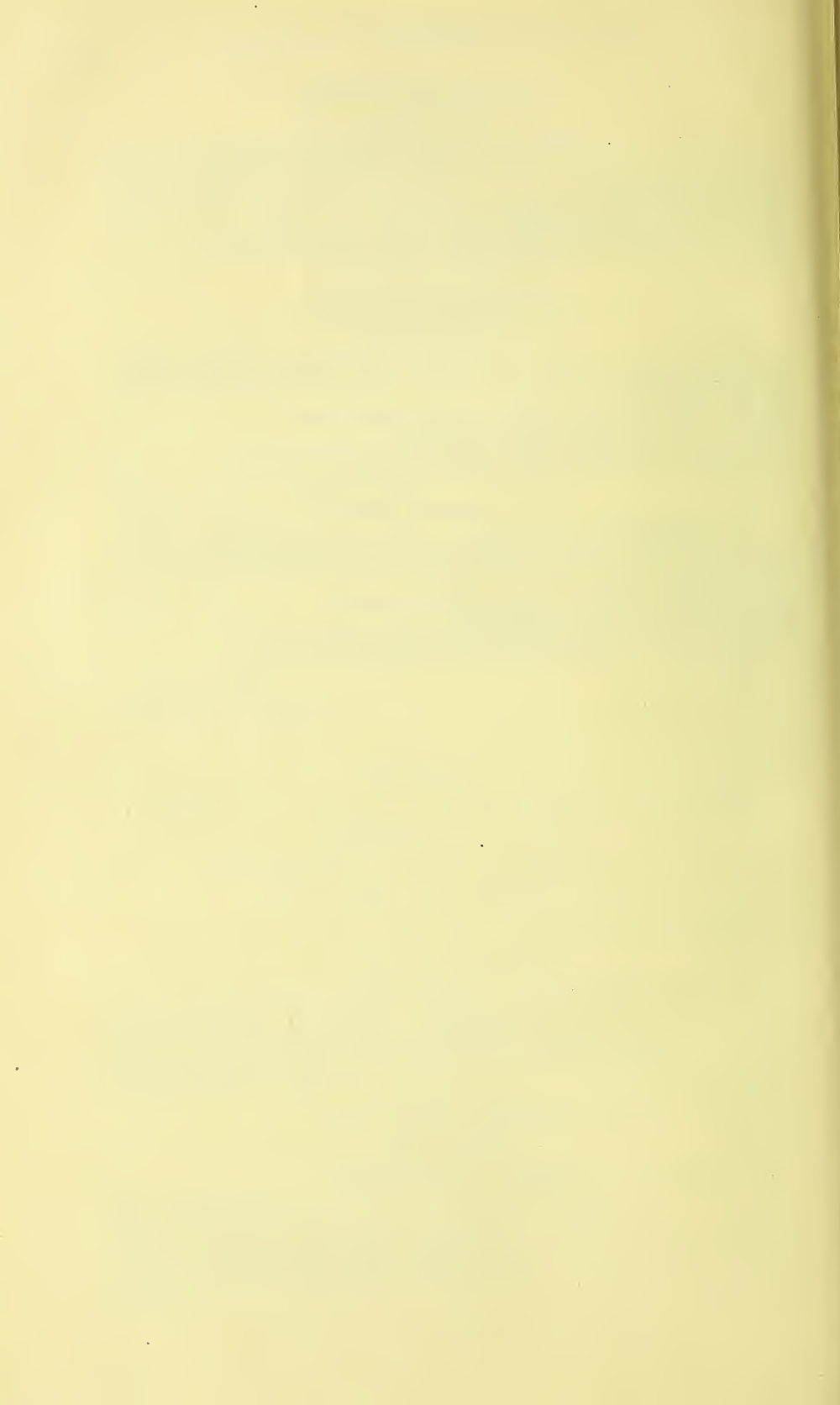
Average strength, 595.

Total number of ' Troop Days ' was, therefore, 602,140.

Total number of ' Sick Days ' was 32,528.

Therefore, the percentage of ' Sick Days ' was 5.25 (approximately).

Average number of ' Sick Days ' per man was 54.



[Friday Morning, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

DIE GESCHICHTE DES ALPENSTICHS

VON PROFESSOR GEORG STICKER, MÜNSTER I. W.

IN den Schweizer Bergen tritt seit Jahrhunderten von Zeit zu Zeit eine bösartige Lungenentzündung epidemisch auf. Das Volk erinnert sich solcher Ausbrüche mit den Namen des heimlichen Stiches, des faulen Stiches, des bösartigen Stiches, im Gegensatz zum Stich schlechthin, der die gewöhnliche Lungenentzündung bedeutet. Der Namen würde wohl über die Grenzen seines Vaterlandes nicht hinausgedrungen sein, wenn nicht ein grosser Lehrer ihn in die Klinik und Epidemiologie eingeführt hätte. Lukas Schönlein in Zürich beobachtete das Uebel in den Jahren 1834 und 1835 in den Urkantonen. Den Ausbruch im Spätherbst 1834 zu Ursern deutete er als larviertes Wechselfieber, weil er ihn den Wasserläufen entlang verfolgen konnte. Von dieser Auffassung kam er zurück, als er dasselbe Uebel zu Beggenried und Buochs im Frühjahr 1835 aufs neue studierte und es diesmal mit einer ausgesprochenen Rotlaufkonstitution einhergehen sah. Vielleicht ist seine Deutung im zweiten Falle ebenso anfechtbar wie im ersten. Gewiss aber ist, dass der grosse Seuchenkenner auf dem richtigen Wege war, im Gegensatz zu seinen Schülern, die später unter dem Namen des *Alpenstiches* eine besondere Seuche konstruierten. Diese Seuche soll seit Jahrhunderten ihre ausschliessliche Heimat in den Schweizer Hochtälern haben, dort fast jedes Jahr vereinzelte Opfer fordern und nach besonders milden Wintern zur Zeit der Schneeschmelze epidemische Macht gewinnen, dann die Alpentäler veröden und sogar über die Grenzen des Berner Hochlandes, des Wallis und Graubündens hinaus in das Rheinland, Waadtland, Tessin, Veltlin hinabsteigen und weiter bis zu den nördlichen und südlichen Meeresküsten mit dem menschlichen Verkehr vordringen.

Diese Vorstellung, die zuerst Guggenbühl im Jahre 1838 zu begründen versucht und dann Feierabend im Jahre 1866 übernommen hat, ist unhaltbar. Weder gibt es eine einheitliche Ursache des bösartigen Alpenstiches noch hat sich diese Krankheit je wandernd als eine weite und breite Epidemie über die Grenzen der Schweiz ausgedehnt. Die beste-
chende Darstellung Guggenbühls beruht auf einer irrigen Auslegung der

Quellen über vergangene Epidemien und auf einer willkürlichen Aneinanderreihung von gleichzeitigen und aufeinander folgenden Ereignissen zu einer ursächlich zusammenhängenden Kette. Wie wenig Guggenbühl befähigt war, historische Daten für epidemiologische Aufgaben zu verwerten, hat für seine Darstellung der Stichepidemien des Jahres 1564–5 Meyer-Ahrens in einer bedeutenden Schrift vom Jahre 1848 gezeigt. Nach dieser Schrift und ihren Quellen bei Conrad Gesner, Thaddaeus Dunus, Johann Weyer u.s.w., schrumpft der grosse Alpenstich vom Jahre 1564 zu einer kleinen Nebenerscheinung oder Teilerscheinung der damaligen Pestkonstitution zusammen. In Wirklichkeit war er, wie ich dann weiter nachweisen konnte, nichts anderes als die uns heute wohlbekannte Winterform der Beulenpest, die pestige Lungenentzündung, wie sie sich seit der Zeit des Schwarzen Todes bis in unsere Tage in zahlreichen Pestläufen gezeigt hat.

Was für die Ausbrüche des bösen Stiches im Jahre 1564 gilt, gilt auch für die weiteren, deren Beschreibungen durch Haller, Tissot, Lebert u.s.w. in die allgemeine Fachliteratur übergegangen sind oder sich aus Schweizer Schriften und Archiven sammeln lassen; und es gilt für die epidemische Lungenentzündung überhaupt. Es handelt sich bei ihr nicht um eine selbständige Seuche, sondern um eine Teilerscheinung verbreiteter Volkskrankheiten, die nur unter ganz bestimmten Bedingungen hervortritt.

Aus mehr als hundert Pneumonieepidemien ausserhalb der Schweiz und aus ihrer Vergleichung mit den schweizerischen Alpenstichepidemien geht hervor, dass ein grundsätzlicher Unterschied zwischen diesen und jenen nicht besteht. Das klinische Bild oder vielmehr die verschiedenen klinischen Bilder des bösartigen Stiches, die die Schweizer Epidemiologie kennt, finden wir in allen Ländern Europas, besonders in den Rheinlanden, in Baden, in Bayern, in Oesterreich, auffallend häufig in Italien.

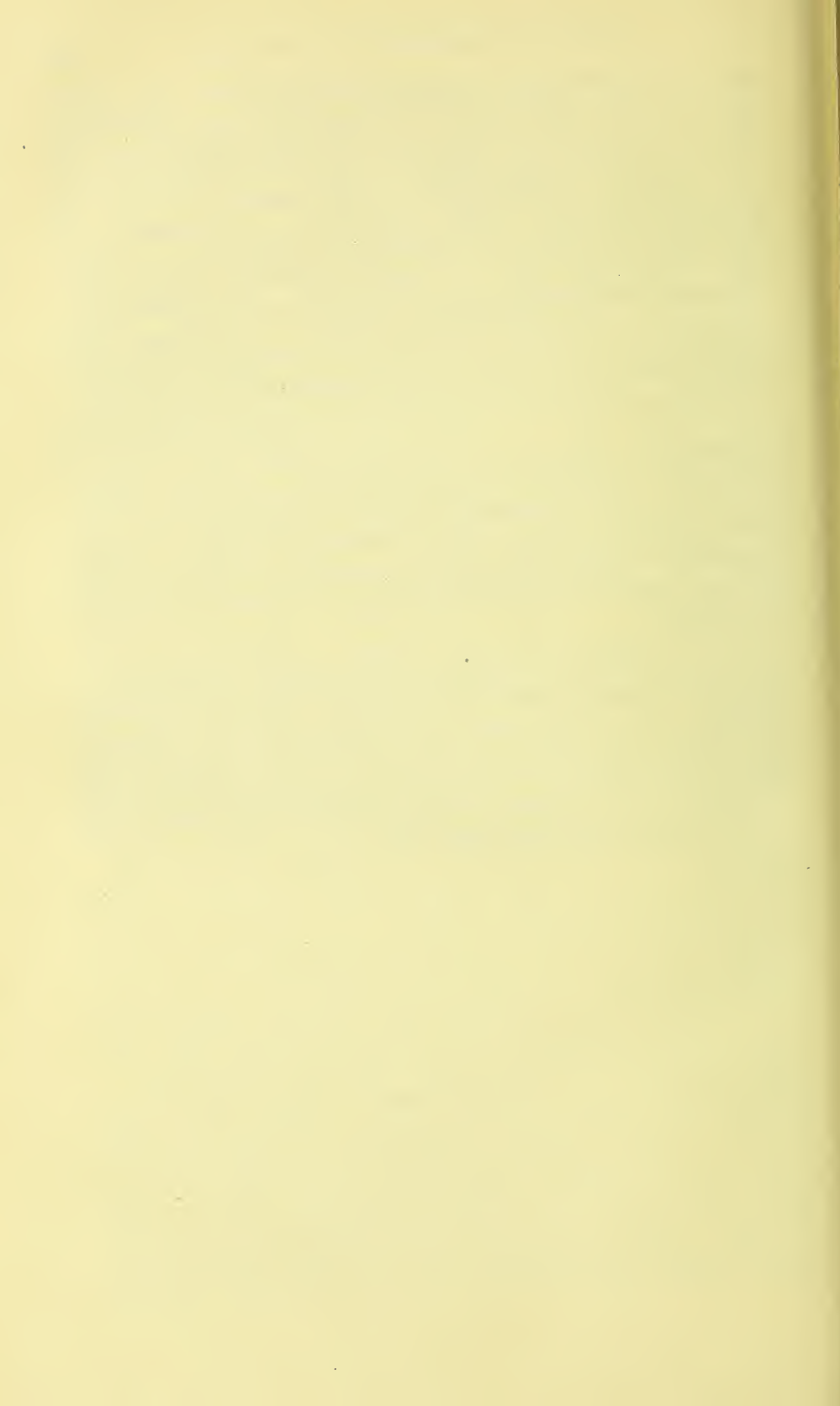
Der sogenannte Alpenstich und die ihm gleichen Epidemien in Europa haben zu verschiedenen Zeiten verschiedene Ursache und entsprechend verschiedene klinische Form und Verlauf. Das eine Mal handelt es sich um die Pestpneumonie, das andere Mal um die Milzbrandpneumonie, das dritte Mal um die Erysipel-pneumonie, das vierte Mal um die Influenza-pneumonie, in einer fünften grossen Reihe von Ausbrüchen um den Pneumotyphus, in jüngeren kleinen Epidemien um die Papageienpneumonie, dann und wann vielleicht auch um Malariapneumonien.

Aber alle diese grossen oder kleinen Ausbrüche von maligner, asthenischer, biliöser, typhöser Lungenentzündung haben ausser ihrer Gefährlichkeit das Gemeinsame, dass sie sich in der kalten und nasskalten Jahreszeit ereignen, zu Anfang oder im Verlauf des Winters, und dass sie mit dem Eintreten eines entschiedenen Frühlingswetters rasch nachlassen und ferner, dass sie kaum jemals für sich allein dastehen — wenn man von den Psittacosisausbrüchen absehen will — sondern sich an eine vorherbestechende Seuche, an einen gewöhnlichen Pestgang, einen gewöhnlichen Typhusausbruch u.s.w. anschliessen oder vielmehr daraus

oder aus einer stehenden Krankheitskonstitution, wie der erysipelatösen, der Malarieendemie, der Anthraxendemie u.s.w., hervorgehen. Eine Pestseuche, die im Sommer als Bubonenpest gewütet hat und im Herbst zu Ende ging, erhebt sich gelegentlich im Winter aufs neue als Lungenpest; ein Bauchtyphus, der im Herbst und Winter das gewöhnliche Bild zeigte, wandelt sich plötzlich gegen Wintersende bei herrschender Tramontana oder beim Wehen des Föhns in einen epidemischen Pneumotyphus um; wo vorher Gesichtsröse, Puerperalfieber, Wundsepsis, Hospitalinfektionen sich häuften, wo eine Milzbrandherrschaft sich im fliegenden Zungenkrebs oder in der schwarzen Pustel bei Vieh und Menschen äusserte, da kann es im Winter zu epidemischer Lungenentzündung mit den Zeichen der spezifischen Infektion kommen.

Zu einer bedeutenden Wanderseuche hat sich kein derartiger Ausbruch erhoben, weder in der Schweiz noch ausserhalb der Schweiz. Ihr gelegentliches Aufkommen an verschiedenen Orten zugleich unter der Herrschaft einer gleichen Krankheitskonstitution und unter dem Eindruck der gleichen Witterungsverhältnisse bedingt hier und da den Schein der Wanderepidemie. Aber in Wirklichkeit handelt es sich um beschränkte stehende Ortsausbrüche von begrenzter Zeitdauer und mit geringer Neigung, auf Menschenansiedlungen in der näheren Umgebung überzugehen.

Die Winterform der Pest, des Typhus, der Milzbrandseuche u.s.w. in Gestalt epidemischer Pneumonie rechtfertigt die alten Begriffe der *Constitutio epidemica* und *Constitutio annua*. Man kann diese Wörter entbehren, aber die Tatsachen, die ihnen zugrunde liegen, verdienen in der Epidemiologie grössere Rücksicht, als sie bisher gefunden haben. Zahlreiche Irrtümer in der Seuchendiagnose beruhen auf ihrer Vernachlässigung, wie der Verfasser in einem besonderen Buche über die epidemische Lungenentzündung zeigen wird.



[Friday Morning, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

THE DEVELOPMENT OF THE DOCTRINE OF
CONTAGIUM VIVUM, 1500-1750

BY DR. CHARLES AND MRS. DOROTHEA SINGER

THE conception of living contagion is one the roots of which may be traced far back into the dawn of medicine. It has, indeed, like many other scientific ideas, appeared more than once, only to disappear again. Thus, among the classical writers of Rome and Greece, we find a distinct tradition of creatures, minute and even 'invisible', bringing disease from marshy land. Although among these writers the idea of contagion is usually absent, we have here, nevertheless, the basic element of our doctrine.

Omitting these and other dim and isolated gropings towards the doctrine of the living nature of contagion, we pass at once to the period of the European revival of learning. There was, in the fifteenth century, already available a rational classification of the phenomena of infection. Thus, in a verse of the school of Salerno, we read that, in order to escape the infection of small-pox, 'children should avoid touching the contagion of the disease—viz. (1) the sick person, (2) the breath of the sick, and (3) the clothes, coverings, garments, and such clean bodies as he may have infected'.¹ Here we have a clear classification of the three types of infection—by contact, at a distance, and by fomites. Such a classification was at least implied by numerous Renaissance writers, among whom we may instance Alexander Benedictus of Verona, 1497,² and Johannes Widman or Salicetus of Tübingen, 1501.³ A third who gave a somewhat similar classification was Philip Beroaldus, in his work on 'Earthquake and Pestilence' of 1510.⁴ Beroaldus sets forth the degrees

¹ For drawing our attention to this passage we have to thank Dr. A. C. Klebs. See that author's paper on 'The Historic Evolution of Variolation,' *Johns Hopkins Hospital Bulletin*, xxiv, No. 265, March 1913, p. 70.

² Alessandro Benedicto, *Quinque Libri de Febribus. Liber Quintus. De Observatione in Pestilentia*, Venice, 1497.

³ Johannes Salicetus, *Tractatus de Pestilentia*, Tübingen, 1501.

⁴ Philipo Beroaldo, *De Terremotu et Pestilentia cum Annotamentis Galeni. Addita est explicatum in Annotamentis Galeni dictionum Tabula*, 1501.

of contagion with some clearness, and certain passages read as though he had a dim idea of a 'contagium vivum'. The early writer, however, who, before all others, placed the theory of infectious diseases on a firm and rational foundation, was Jerome Fracastor, whose work, *De Contagione*, appeared in 1546, and marked an era in the history of medicine.

It is not necessary to say anything here in detail concerning Fracastor's work.¹ He distinguished clearly the three types of infection, and established the word 'fomes' in its modern sense. He differentiated a mere poison which cannot multiply itself, from an infection which can do so. To explain the latter phenomenon, as well as the passage of an infection over an intermediate space, or by means of fomites, he revived an atomic conception of Lucretius, and regarded infective bodies as 'seminaria', emitting 'semina' of disease. Probably these words had not for Fracastor the full significance that has since been attributed to him, or rather it may be better expressed that, like all great writers, his meaning was deeper than he himself realized.

Fracastor's works were widely read from the very date of their publication, but it was more than a century before his brilliant insight into the essential nature of infectious diseases led to further definite progress. Indeed, for three centuries following Fracastor's death, the views generally held were retrograde as compared to his. The great majority of writers of the sixteenth century who quote him (with or without acknowledgement) are mere copyists and add nothing to the conceptions of the master, and it is probable that, with the exception of a small school at the beginning of the eighteenth century and a few writers of earlier date, Fracastor's work was never fully understood until modern times. It would be impossible here to mention even a tithe of those sixteenth-century writers on the plague and other infectious diseases who owed their theories entirely to Fracastor. Among those who comprehended him more thoroughly may be mentioned the botanist, Andrea Matthioli (1554),² who applies the theory specially to rabies, Francesco Boccacino (1556),³ Gabriel Ayala (1562),⁴ Jerome Dónzellino (1570),⁵ Antonio Saracenus (1572),⁶ Philip Ingrassias

¹ Hieronymo Fracastoro, *De Sympathia et Antipathia Rerum Liber Unus de Contagione et Contagiosis Morbis et Curatione Libri III*, Venice, 1546.

² Petra Andrea Matthioli, *Commentarii in Libris Sex Pedacii Dioscoridis*, Venice, 1554.

³ Francisco Boccacino, *De Causis Pestilentialibus urbem Venetani opprimentis*, Venice, 1556.

⁴ Gabriel Ayala, *De Lue Pestilentie Elegiarum liber unus*, Antwerp, 1562.

⁵ Hieronymo Dónzellino, *De Natura, Causis et Legitima Curatione Febris Pestilentie*, Venice, 1570.

⁶ J. Antonius Saracenus, *De Peste Commentarius in quo præter pestis naturæ, præcautionis etiam atque curationis ipsius uberiores explicationem, non pauca quæ super eadem materia hoc nostro seculo et cælo in contentionem plerumque veniunt obiter strictimque tractantur*, Lyons, 1572.

(1576),¹ and Andrea Gratiolo di Salo (1576).² Especial mention may be made of Le Paulmier de Grentemesnil,³ who, in 1578, reapplied Fracastor's views to syphilis, and Jerome Mercurialis,⁴ who followed Fracastor very closely and spoke of him as 'the first who opened men's eyes to the nature of contagion'.

In a few works of the sixteenth century there are certain additions to the conceptions of Fracastor, though it is often difficult or impossible to trace such suggestions to their true source. Thus, the great name of Jerome Cardan may be associated with the suggestion that the seeds of disease are truly living, and reproduce their kind after the manner of minute living animals (1557).⁵ Cardan regarded the inorganic world as animated no less than the organic, while in his suggestions that all animals were originally worms and that all creation is of the nature of a progressive development we may clearly discern the germinal ideas of modern conceptions.

Suggestions similar to those of Cardan, but bearing even more directly on the subject in hand, were made by Victor de Bonagentibus (1556), who freely compared the generation and conveyance of fevers to the putrefactive processes which produce 'worms' in corpses.⁶ De Bonagentibus shows considerable grasp of Fracastor's theories in dealing with the question of fomites, and invokes scabies especially in this connexion. Another follower of Cardan was Gabriel Fallopius (1564),⁷ who connected the living and exhaled corpuscles more especially with phthisis and syphilis. One passage in the work of this writer might be interpreted as implying a knowledge of the corpuscles of the blood, which he regarded as exhaled in the disease. This and similar passages were a stumbling-block to the early microscopists of the following century, many of whom interpreted the blood corpuscles, which they really *did* see, in the light of the hypothetical corpuscles of Fallopius, Fracastor, and others. The lines in question in Fallopius's book may be translated as follows: 'Every contagious disease spreads itself throughout the whole infected

¹ Giovanni Philipo Ingrassias, *Informatione del pestifero e contagioso morbo il quale affligge et have afflitto questa città di Palermo e molle altre città e terre di questo regno di Sicilia nell' anno 1575 et 1576*. Data allo invittissimo et potestissimo re Filippo di Spagna, 1576.

² Andrea Gratiolo di Salo, *Discorso di peste . . . con un catalogo di tutte le peste piu notabili de tempi passati*, Venice, 1576.

³ Jul. Palmarius (le Paulmier de Grentemesnil), *De Morbis Contagiosis libri septem . . . De Lue Venerea Libri duo*, Paris, 1578.

⁴ Hieronymo Mercuriali, *Lectiones Patavii habitu 1577 in quibus de Peste . . . tractatur. De peste in Universum, præsertim vero de Veneta et Patavina. Prælectiones Pat. eruditæ*, Venice, 1577.

⁵ Jerome Cardan, *De Rerum varietate*, Basel, 1557; see also the same author's *De Subtillitate Rerum*, Basel, 1554, for animated effluvia. The inter-relationship of the work of Cardan and Fracastor requires further investigation.

⁶ Victor de Bonagentibus or de Bonagens, *Decem Problemata de Peste*, Venice, 1556.

⁷ Gabriel Fallopius, *De Morbo Gallico Tractatus*, 1564.

substance. Thus, in phthisis, this force of contagion is conveyed by the vapour which comes from the lungs. This vapour contains certain minute corpuscles of the blood, which issue forth with the breath, and are spread by the circumambient air. So they are attracted to the lungs of another, and if they thus reach a suitable soil, they infect it and communicate the disease.'

Very numerous writers of the sixteenth century contributed to corrupt and few to develop the original doctrine of seminaria as set forth by Cardan and Fracastor. One of the clearest and best enunciations is that of a certain Jerome Neuman,¹ in a commendably short thesis at the University of Wittemberg in 1593. Speaking of the way in which the contagion of small-pox and other infectious diseases is conveyed, he tells us that 'we may attribute it to certain very minute corpuscles beyond the reach of sight, though themselves the very seeds of the diseases. Diffused through the body, they are communicated to another person by means of fomites, or maybe at a distance . . . and in this way from a single focus may be dispersed among many.'

At the end of the sixteenth century and in the first half of the seventeenth several diverse currents of thought served to give a more definite and lucid direction to speculations on the subject of the nature of contagion. It was the ultimate convergence of these various currents that gave rise to our modern theory of living contagion. First and foremost in importance among these early tendencies, though last in date, must be placed the teaching of the philosopher Descartes. The contemporary revival of the atomic theory of matter together with Descartes' conception of vortices made it possible for a new and more definite idea to be formed of minute masses beyond the reach of sight and touch, and thus stimulated speculation along the lines suggested by Cardan and Fracastor.

Again, the use of the magnifying glass and, at a later stage, of the compound microscope revealed to many the existence of infinite numbers and varieties of animate creatures that had previously been visible only to the sharpest eyes. We do not here allude to the true microscopic revelations which date from the improvement of the microscope, simple and compound, about the middle of the seventeenth century, but rather to the more elementary observations of small insects and worms which were assisted and confirmed rather than revealed by the magnifying glass. Thus, as early as 1508, and before the appearance of Cardan's works, Alexander Benedictus,² a townsman of Fracastor, had given accounts of minute 'lumbrici' in cheese, teeth, lungs, kidneys, and skin. He appears to have been quite familiar with living creatures as a cause

¹ Hieronymus Nummanus, *De Variolis et Morbillis*, Wittemberg, September 27, 1593.

² Alessandro Benedicto, *Omnium a Vertice ad Calcem Morborum signa, causæ, indicationes et remedium compositiones utendique rationes generatim libris XXX conscripti*, 1508.

of disease, and he certainly knew of the organism of scabies. The *Acarus scabiei* was, indeed, known to very many sixteenth-century writers—Paracelsus and Ambroise Paré among them—and Sir Theodore de Mayerne, in his preface to Mouffet's *Insectorum Theatrum*¹ (written about 1590 and published 1634), tells us how he was accustomed to observe the little creature with a magnifying glass. 'If you will take,' says Mayerne, 'lenticular optick glasses of Crystal, (for though you have Lynx his eyes, they are necessary in searching for Atoms) you will admire to see . . . the Fleas that are curasheers, and their . . . hollow trunk to torture men, which is a bitter plague to maids . . . you shall see the eyes of the Lice sticking forth, and their horns, their bodies crannied all over, their whole substance diaphanous, and, through that, the motion of their heart and blood as if it floted in *Euripus*. . . . Also little Hand-worms which are indivisible, they are so small, being with a needle prickt forth from their trenches near the pool of water which they have made in the skin, and being laid upon one's nail, will discover by the sunlight their red heads and feet they creep withal.' Mouffet himself refers to these acari as 'the smallest of living creatures'. He compares them to the mites of cheese, and correctly distinguishes them from the pediculi.

The *Acarus scabiei* was first figured by August Hauptmann in 1657,² but long before then the idea of acari as giving rise to the itch was much commoner than is perhaps usually realized, and had passed from professional writers into the popular tongue. Thus the association of atoms and itch mites³ with scabies is encountered in a charming passage in *Romeo and Juliet* (Act I, sc. iv), first published in 1597, where Mercutio says :

O, then, I see Queen Mab has been with you,
 She is the fairies' midwife; and she comes
 In shape no bigger than an agate-stone
 On the fore-finger of an alderman,
 Drawn with a team of *little atomies*.

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¹ Thomas Mouffet, *Insectorum sive Minimorum Animalium Theatrum*. The original MS. of this work, written about 1590, is now in the British Museum (Sloane MS. 4014, with engraved portrait). The work fell into the hands of Mayerne and was published by him in 1634. A beautifully translated English version of the work and of Mayerne's preface, from which the above quotation is made, appeared from the hand of J(ohn) R(owland) in 1658 as *The Theatre of Insects or Lesser Living Creatures*.

² August Hauptmann, *Uralter . . . warmer Badt- und Wasser-Schatz*, Leipzig, 1567, p. 200.

³ It is interesting in this connexion to observe that the word mite is probably derived from a Gothic root *mei-*, to cut or divide, and the original connotation of the words *mite* and *atom*, which in the seventeenth century were often interchangeable, is really similar. Both words imply a fragment of matter so far broken up that its further division is impossible.

Her waggoner, a small grey-coated gnat,
Not half so big as a round little worm
*Pricked from the lazy finger of a maid.*¹

And in this state she gallops night by night,

O'er ladies' lips, who straight on kisses dream ;
Which oft the angry Mab with blisters plagues.

The influence of current theories on the lay mind may also be seen in a book of Monconys's, written about 1629.² In the course of this work he describes the custom of 'caprification' as practised in the Greek islands, and he tells how the women gather wild figs and lay them to decay on trees of the cultivated variety. This is Monconys's admirable explanation of the custom. 'Nature', he writes, 'has provided all animals and plants with an infinite number of minute invisible insects, which are for the purpose of sucking and drawing forth the corruption and impurities incident on vital processes. They are like the emunctories of Nature, and if, by some disturbance, these little living atoms increase and multiply praeternaturally, then epidemics arise which cause mortality among their hosts. 'There have, indeed, been observed in the buboes of the plague-stricken immense numbers of these insects which, taking wing, convey the infection far and wide. It is probable that similar minute insects remove foreign and excrementitious matter from the figs, and thus get rid of the very principle of putrefaction, and so after this the fruit remains attached to the tree until it is perfected.'³

Monconys also definitely makes the suggestion that figs have sexes, and that insects take a part in their fertilization, and he comes very close to the modern view of caprification, which regards the development of the fig as aided by the entrance of minute hymenoptera through the terminal pore. The process has, therefore, definite analogies with infection. Surprising as seems the originality of Monconys's views, he may have derived them, in part at least, from Cesalpinus, who had spoken of a 'halitus' or emanation from the male plant fertilizing the female.⁴

¹ At this date it was customary to treat scabies by the removal of each separate acarus with a needle. So laborious a process was naturally as a rule far from complete.

² De Monconys, *Journal des Voyages*, Paris, 1647. Posthumously published by his son.

³ Caprification and its kindred custom Palmification are of immeasurable antiquity. They are mentioned by Herodotus, and were apparently known to the Egyptians, Hebrews, Greeks, and Babylonians. The importance of insects in the process was realized by Pliny. The sexual character of plants was also entertained at a very early date, and is referred to by Aristotle, Theophrastus, and Pliny, among others. The association of figs and plague was probably suggested to Monconys by Isaiah xxxviii. 21, or by Jeremiah xxiv.

⁴ Andreas Cesalpino, *De Plantis libri XVI*, Florence, 1583.

Monconys, however, had certainly the priority of Nehemiah Grew¹ and of Thomas Millington, who are usually regarded as the founders in modern times of the sexual theory in plants.

While speculation such as we have illustrated from Mouffet and Monconys was concerned with the nature and meaning of minute living creatures, another group of ideas was assisting to develop and clarify the prevalent conceptions of the nature of infection. These ideas dealt with the nature of ferments and their relation to infective processes.

From earliest times an association had been observed between putrefaction and fevers. Moreover, some exact knowledge was available as to the phenomena of fermentation. Thus, among Hebrew writers, considerable attention had been paid to the nature of leaven, from the importance of that subject in the celebration of the Passover. In a remarkable passage in the Talmud² the processes of reproduction and putrefaction are brought into comparison. Among Christian writers also the importance and nature of wine in the celebration of the Communion had given rise to an extensive theological literature, and the question of the use of azym bread for the Eucharist was fiercely debated in the eleventh century both in the East and in the West. Early in the sixteenth century Paracelsus had realized that digestive processes were of a chemical nature, and drew an analogy between digestion and fermentation. Later writers on alchemy regarded concoction, digestion, and fermentation as more or less interchangeable terms, applicable to any process in which effervescence or other form of chemical energy was markedly exhibited. With this list of ill-defined processes putrefaction became early associated. The analogy between putrefaction and fermentation is fairly obvious even to a non-scientific observer, and the confusion thus became deeper.

Another set of ideas that had its bearing on the nature of putrefaction and fermentation was very familiar to mediæval minds. To them the resurrection after death was certainly more vivid and immanent, if not more real, than in these times, and was, indeed, regarded as a direct physical phenomenon. The worms in the decaying corpse, the bees in the carcase of Samson's lion, and scores of other trite and well-worn illustrations of the visible production of life from corruption occur in much scientifically barren literature, as well as in technical medical works. Towards the end of the sixteenth century these conceptions were woven together with those of fermentation and putrefaction by more than one author.

In particular Andrea Bacci (c. 1540 to c. 1600), a writer now altogether forgotten, gained a clarity of view distinctly ahead of his age in dealing with the nature of fermentation. Bacci was Professor of Botany at Rome between 1567 and 1600, and physician to Sixtus V. He was a man of very considerable learning and antiquarian tastes. On medical

¹ Nehemiah Grew, *Anatomy of Plants*, London, 1682, and previous papers before the Royal Society.

² Pirke Aboth III. 1.

subjects he wrote little, but, like his successor, Redi, and his predecessor, Fracastor, he had a foible for treating—in a literary sense—the subject of wines.¹ He had marked literary gifts, and his works contain passages of real beauty. One of these passages we here render. It contains the first clear attempt to demonstrate the organized basis of a ferment, and though we know now that the nematode which finds a home in vinegar has no part in the fermentative process, yet Bacci, in his general conclusions, is not so very far from modern conceptions of the subject.

‘In all vinegar you will find an immense progeny of tiny worms—atoms indeed, but living atoms. In the process of preparing a certain drug by moistening a handful of quicklime with vinegar, I saw myriads of little creatures germinating there. . . . It is my opinion that in that part which is regarded as merely sediment resides the whole strength of vinegar. This virtue seems to me to consist of the worms themselves, formed from the very dregs of the vinegar, which, by reason of their infinite powers of propagation, really teems with life. . . . Furthermore, vinegar, when boiled, was found to be purged of its worms. I noticed, however, that by this process it was entirely deprived of its virtue, and was clouded and had lost its acidity, an observation which any one may repeat.

‘But here another problem presents itself, viz., if there can be the same power and virtue in vinegar, whether formed by the degeneration of putrefied wine or by wine that has lost its strength. For my own part, I hold that ultimate qualities of things cannot be inferred from their origin, and I abandon the usual philosophical position that corruption and generation are of different orders. Nay, rather the contrary is the case. Thus, from any putrid matter a re-creation takes its rise—a thing well known in Nature. With her nought is cast away as superfluous or useless, but she is for ever intent on reproducing and perfecting. . . . With her nothing is barren or inert. Reproduction is her steadfast course, although the product varies, according to conditions and forces. Thus, many creeping and swimming things are brought to perfection by the very force of corruption, and are reborn as butterflies, or as beautiful winged insects glittering like stars and gems, and glorious with purple and green and gold.’

Bacci, however, though an original thinker and a pleasing writer, did not exercise a very extensive influence on the thought of his day. Similar views diluted with a flood of Aristotelian phraseology and expressed by the theologian Erastus,² an older contemporary, seem to have carried more weight, but it was left for Van Helmont to introduce some order into the welter of ideas on putrefactions, ferments, and fermentation, contagion, generation, leaven, and corruption, which prevailed at the beginning of the seventeenth century. Helmont (1577–

¹ Andrea Bacci, *De naturali vinorum historia, de vinis Italiae et de conviviis Antiquorum Libri Septem . . . Accessit de factitiis et cervisiis . . . de totius Europæ Vinis et de omni Vinorum usu*, Rome, 1596.

² Thomas Erastus, *Disputatio de Putredine*, Basel, 1580, and other editions. Also the same writer's *De quibusdam quæstionibus ad curationem Pestilentiae pertinentibus* (dedicated to Conrad Gesner), Zurich, 1565, and his *Disputationum et Epistolarum volumen doctissimum*, Zurich, 1574 and 1596.

1644)¹ seized and developed the association between fermentation and digestion. He regarded the course of nutrition as determined by 'ferments'. It is the function of these ferments to convert or concoct dead food into living tissue. He goes, however, further, and regards the vital processes themselves as due to these ferments, which thus appear indistinguishable from the *Archeus*. The confusion is, after all, not vastly greater than the mystery of the vital and chemical relationship of our modern unorganized ferments or enzymes, the root idea of which is contained in Helmont's works.

The doctrine of ferments was little further developed until the latter third of the seventeenth century, when a school of writers and investigators brought it more definitely into relation with epidemics. Few of these writers are known to fame, the most distinguished of them being John Mayow, Jean Pascal, William Cole, Melchior Geuder, and J. F. Böckelmann.

Mayow (1643-79),² whose early death prevented the full display of his great powers, introduces a conception of ferments derived from animal spirits, by which he reasons that the ferment is derived from the animal economy and not extrinsically.

Jean Pascal³ published in 1681 a work which is interesting as containing an early suggestion of a distinction between the two types of organized and unorganized ferments. Apart from the digestive ferments, he considers that there are yet others. When the blood becomes surcharged with the various secretions which disturb its normal functions, these other ferments assist the body to rid itself of the injurious materials by a process which redistributes the particles of the deleterious substances and renders them harmless. Pascal, who is obviously under the influence of Helmont, regards this latter type of ferment as due to chemical changes, and he distinguishes between these bodily ferments, which he calls fixed, and other ferments, such as those of wine and bread, which he calls volatile. His fixed and volatile correspond partly to our unorganized and organized ferments respectively. The process of generation he regards as nearly comparable to the action of a volatile ferment.

William Cole,⁴ an obscure English writer of the school of Willis,⁵ claims mention here for his good definition of a ferment as 'a body which, however small in bulk as compared to the substance to which it

¹ Jean Baptiste van Helmont, *Ortus Medicinæ*, being his collected works posthumously published by his son, Franz Mercurialis, in 1648.

² John Mayow, *Tractatus Quinque Medico-Physici*, 1674.

³ Jean Pascal, *La nouvelle découverte et les admirables effets des ferments dans le corps humain*, Paris, 1681.

⁴ William Cole, *Tractatus de Secretione Animalis*, The Hague, 1681. Also *Novæ Hypotheses ad Explicanda Febrim Intermittentem*, London, 1693.

⁵ Thomas Willis, *De Veneni Pestilentis natura et origine seu causis*, Amsterdam, 1671. Also a treatise on Fermentation, translated by S. P., 1681, and other works.

is added, is yet able to so greatly excite the particles as to produce the most marked changes'.

A group of writers on ferments also arose around J. F. Böckelmann¹ at Leyden. Like Pascal, these writers came near to a distinction between organized and unorganized ferments. They draw a line between fermentation and putrescence on the one hand and digestion and concoction on the other. At about this date also were published the investigations of Peyer,² Brunner,³ Sylvius,⁴ and de Graaf.⁵ This work threw light on the specificity of the ferments of the different parts of the alimentary canal, and the distinction of these from the volatile ferments was thus emphasized. The best and clearest view of the knowledge and literature of the day on this subject is, perhaps, contained in a little book by Melchior Geuder,⁶ published in 1689. Geuder's book is dedicated to Robert Boyle, who must be regarded as a rather belated member of the same school.

Leaving for the moment conceptions of fermentation, we return to a somewhat earlier period of the seventeenth century, when the direct influence of the philosophy of Descartes was still reigning supreme. By far the most philosophical writer who came at least to some extent under this influence was our own William Harvey. Unfortunately, in his printed writings at least, Harvey gave very little attention to the subject of infection, although several passages⁷ suggest a line of thought which seems about to lead to a 'vitalistic' solution of the problem. Thus, in one of his letters to Naldi, dated November 30, 1653,⁸ he wrote, 'Among other things that delighted me greatly in your book was that part where I see you ascribe plague almost to the same efficient as I do, animal generation.' Closely associated with Harvey was his friend and intimate, Sir George Ent, who, under the influence of microscopical discoveries, appears about the same date to have definitely accepted the view of infection being conveyed by minute organisms.

¹ Johan Frederick Böckelmann, see A. Raven, *De Vermibus Intestinorum*, Leyden, 1675.

² Johan Conrad Peyer, *Parerga anatomica et medica*, Geneva, 1681, and earlier editions. Also *Merycologia sive de Ruminantibus et Ruminatione Commentarius*, Basel, 1685.

³ Joannes Conrad Brunner, *Experimenta nova circa pancreas. Accedit diatribe de lymphæ et genuinæ pancreatis usu*. Amsterdam, 1683. Also theses read before him by G. F. Franck von Franckenau, *Exercitatio de Glandulis*, 1687, and J. A. Sebizius *Exercitationum pathologicarum . . . Strassburg Tomus prior*, 1674. The work on *Glandula duodeni seu Pancreas secundarium* with which Brunner's name has since become connected was not published until 1715.

⁴ Francis de la Boe (Sylvius), *Disputationum Medicarum decas in Opera Medica*, Amsterdam, 1680.

⁵ Regnier de Graaf, *Tractatus anatomico-medicus de succi pancreatici natura et usu*, Leyden, 1671, and *Opera Omnia*, 1677.

⁶ Melchior Frederick Geuder, *Diatribe de Fermentis*, Paris, 1689.

⁷ Especially in his *Exercitationes de generatione animalium*, London, 1651.

⁸ See *The Works of William Harvey*, by Dr. Robert Willis, London, 1647.

The earliest writer who succeeded in uniting the various threads which we have so far traced was August Hauptmann, who, in 1650, issued at Frankfort a little pamphlet of twenty-three pages, entitled *Epistola Præliminaris Tractatui de viva mortis imagine*,¹ dedicating it to Pierre Jean Fabre. Fabre had himself some years previously set forth a view of the reproduction of corruptions in the form of fevers. Huptmann, however, passed far beyond this. He considered that fevers were caused by minute animalcules of the nature and form either of worms or of their eggs. These worms and eggs are invisible, but widespread, and are the cause of malignant fevers and of contagious diseases. He sums up that 'very minute and almost invisible animalcules are the cause of all deaths in men and animals. The creatures are minute wormlets beyond the reach of the unaided senses. They form their own tiny bodies from certain kinds of very subtle corruption'.

Hauptmann's illustrations are less happy than his generalizations. He assures us that 'animalcules (cridones sive Dracunculi), insects, moths, and little corroding malignant worms and acari swarm in the discharges and humours of measles, scabies, and small-pox, and both give rise to the lesions and cause their rupture. All these kinds of insects', he says, 'may be regarded as different kinds of death.' Although Hauptmann's language was obscure, his knowledge slight, and his attitude credulous, he really added a new conception to science, and must be regarded as one of the founders, though but a humble one, of modern pathology. He exercised a small, though definite, influence on the generation that immediately followed him.

The next writer, and one of the most important with whom we have to deal, is the Jesuit Father, Athanasius Kircher, who is sometimes regarded as the father of the germ theory of disease. Kircher was one of those writers far more esteemed by his contemporaries than by later generations, but at least the industry of the author of several shelves full of learned books may still excite our wonder. In most of his works Kircher is completely uncritical and lacking in judgement, though he displays some originality and a vast power of absorbing knowledge. In the *Scrutinium Physico-medicum Pestis*, however, he shows genuine insight, and gains a clear, though distorted, view of organisms of minute size acting as the vehicle of contagion. There seems no reasonable doubt that he did use the microscope a great deal, though how he succeeded in finding time to do so, with his endless preoccupations, must remain a mystery. Although he speaks constantly of living and moving organisms in the blood and other fluids, it seems probable that the phenomena observed by him were really blood corpuscles. As regards organisms such as Infusoria on the other hand, some of which are within the bounds of unaided vision, it appears to us probable that he long preceded Leeuwenhoek.

Although the principle of the compound microscope was known to

¹ The work to which this was a preliminary was never issued.

Kircher, he used, at first, the simple form of the instrument adopted by his younger contemporary, Malpighi. In 1646 he published his *Ars Magna Lucis et Umbrae*, in which he describes the simple instrument that he used, and states that it was given him by Cardinal Giovanni Carlo, son of Cosimo Medici II. Later he adopted an excellent form of compound microscope with a coarse and fine adjustment and a rough attempt at a substage condenser. This microscope has been figured for us by Buonani.¹

Kircher's *Scrutinium Physico-medicum* appeared in 1658. It is by no means easy to give a quotation from that work without tearing it from its context, and so distorting the always hazy, but never shallow meaning. Translation of Kircher is indeed practically impossible, for the Latin circumlocution, the parentheses within parentheses, and the juxtaposition of mutually destructive points of view seem part of the man. Isolated passages from the book would appear to set forth the theory with great definiteness, but to cite these by themselves would be to misinterpret the nature of Kircher's mind, and to attribute to him a philosophic definiteness that he by no means possessed. The following passages, which contain many of the current doctrines of the day, furnish, we believe, a fair example of his habitual mental attitude :

' Air can be considered as to its essence or as to its accidental properties, and also as to its properties acquired as a result of deterioration—properties called by the Greeks miasmata. By nature air, like fire, is pure, but damp vapours, fog, &c., corrupt it, and are wafted with it to the detriment of plants and animals. Also after earthquakes, noxious vapours from the crevasses infect plants, which infect animals, which finally infect men with the plague, the contagion at each stage being absorbed with the food.

' For when holes and caves are rent open by the yawning of the earth, is it not likely that these infect the ground and so transmit the poison to plants, roots of herbs, fruitful trees, flowers and fruits, whence innumerable harmful little creatures are engendered? The infected vegetabilia being taken by animals for food, man himself in his turn is regaled with the flesh of the infected animals, and thus his blood is corrupted and the deadly weapon forged.

' The enemy who has upset the fortress which is built up of the natural heat and moisture (i. e. the inward spirit of life, the very heart of mankind, the *Archeus*), this enemy remains within, and effects an entire change. The change springs from different seeds through which the putrefaction is matured, which putrefaction destroys life, and when the body is dead flows out, distributing the disastrous poison far and wide.

' Plague, now become a *transmitted* putrefaction, works its evil way not only through the four elements, but also by means of its hidden seeds of deadly nature, and so it is no wonder that remarkable symptoms result.

' For corruption forces its way into the body through the impaction of these little poisonous corpuscles, and drives out the natural heat. So the terrible disease takes its first origin from one or several victims who are first seized with it. Thus, as we have said, one cause of the plague is

¹ Filippo Buonani, *Ricreazioni del' occhio e della mente nella osservazione delle chioccioline*, Rome, 1681.

the outwardly corrupted air, and when this air reaches the lungs and is sent thence to the inward members, there is strife between the opposing spirits until the poisonous and baneful elements overcome the beneficial.

'Poisonous corruption, having expelled the natural warmth, is the sole cause of contagion . . . for it gives rise to an evil breath, which is exhaled into the air, carrying with it the poisonous corpuscles. . . . These corpuscles are minute, and are the really poisonous part of the breath, for they are very adherent, and at once attach themselves to the bed-clothes . . . and to the garments of the bystanders . . . cling to the hands, and even insinuate themselves into the very pores . . . and cause the commencement of an epidemic.

'Thus, then, every vestige of living spirit and of inward heat being driven forth, only putrescence remains, and this so works upon the members that the carcase becomes a mass of putrefaction, in which are hidden the true seeds of the plague. These seeds, produced and occasioned partly by forces within the body and partly from the outward evil vapours themselves, constantly emanate poisonous corpuscles, and the greater the venomous power of these, the further will the contagion spread. *At first these corpuscles are lifeless. When, however, they receive the outward heat from previously contaminated air, then each and every one of these countless minute bodies becomes changed into a little invisible worm. The poisonous exhalation can now no longer be regarded as lifeless, but has become a living effluence.*'

The passage will be seen to be very similar in places to the one we have quoted above from Fallopius. Kircher's attention had been repeatedly directed to the appearance of organized bodies in fermented substances, in blood, cheese, &c., and to the supposed power of putrefaction to generate worms. It might at first, therefore, be supposed that he shared the normal views of his age on the subject of spontaneous generation. It is characteristic, however, of his labyrinthine methods that he is quite capable of holding, without discomposure, diverse and contradictory views on any subject. Thus, we find in his work passages which foreshadow our modern conception of universal biogenesis.

'Nothing living', he says, 'can be nourished except by what was once itself living. You may say you have seen such things happen, but I say to you that of their very nature nothing living could come from them, but only from the seeds of growing and sensitive life mixed with them and afterwards combined with damp and heat.'

Kircher's views immediately attracted much attention in every country in Europe. In Germany, within a year of the publication of the *Scrutinium Pestis*, the volume found an editor in Christian Lange, the elder (1619-62), of Leipzig.¹ Lange, in a credulous work,² which saw the light two years previously, had already faintly suggested the theory. He now seized eagerly on Kircher's views, editing his work with an enthusiastic preface of his own (1659), and later bringing out a third

¹ Christian Lange, *A Kircheri Scrutinium . . . pestis cum præfatione*, D.C.L., Leipzig, 1659.

² Christian Lange, *Miscellanea curiosa medica*, Leipzig, 1656.

edition in German.¹ It was thus largely through his advocacy that the views of Kircher gained wider notice. Lange extended the idea of a living contagion to other diseases besides the plague. He was one of the earliest to introduce the microscope into practical medicine, and he especially claimed to have found organisms in the sputum of phthisical patients. These organisms were in all probability pus corpuscles. Lange's work is also to be read in the theses of his pupils. Among these was one Macasio, who, as early as 1660, set forth the doctrine of the specificity of infectious organisms,² a doctrine which was further elaborated by Lange himself in his *Pathologia Animata*.³

A new development of scientific thought is almost always evolved independently from more than one centre, and priority of publication becomes largely a matter of accident. There were thus several who followed hard on Kircher's heels. Gerard Blasius, Professor of Medicine at Amsterdam, reached conclusions very similar to those of Kircher and Lange⁴ at almost the same date, and gathered around him a small school. In the same year as the publication of Kircher's book there appeared also a publication by one Senguerdus,⁵ in which a chapter devoted to 'Minima Naturae' contains similar ideas developed under strong Cartesian influence. In Italy the Jesuit father had numerous followers, of whom the most worthy of notice are Lana⁶ and Gastaldi.⁷ In England, also, his doctrine found adherents, among them being such well-known names as Charleton, Ent,⁸ and Slare.⁹ That foul-mouthed father of modern journalism, Marchamont Nedham, also wrote a confused but interesting work in support of the same doctrine.¹⁰

After the publication of Kircher's views it was naturally not long before the lesions of that most truly contagious of all diseases, syphilis, were explored to demonstrate the existence of organisms in the discharge. The first of these researches known to us, carried on by means of the microscope, was published in 1676, when a physician named Guide

¹ Christian Lange, *A Kircheri . . . Natürliche und medizinalische Durchgründung der leidigen ansteckenden Sucht*, Augsburg, 1680.

² Johan Centurio Macasio, *Pathologiæ Animatæ Specimen*, Leipzig, 1660. Thesis read before Christian Lange, the elder.

³ Christian Lange, *Pathologia Animata, seu animadversiones in pathologiam Spagirican*, 1688.

⁴ Gerard Blasius. See two dissertations of C. de Vogel, *Disputatio de Peste—prior et posterior*, Amsterdam, 1663. Similar views were reached later by Cornelius Bontekoe, another pupil of Blasius.

⁵ Arnold Senguerdus, *Physicæ Exercitationes*, Amsterdam, 1658.

⁶ Francesco Lana, *Prodromo dell' arte maestra*, trattato dei Cannocchiali, 1684.

⁷ Geronimo Gastaldi (Cardinal), *Tractatus de avertenda et profliganda peste, politico-legalis*, Bologna, 1684.

⁸ Walter Charleton and Sir George Ent had apparently accepted Kircher's views in 1665-6. See Birch's *History of the Royal Society*, vol. ii, p. 69.

⁹ Frederick Slare in *Phil. Trans.*, vol. xiii, 1683, p. 93.

¹⁰ M(archamont) N(edham), *Medela Medicinæ, A plea for the free profession . . .* London, 1665.

stated that, in conjunction with Bourdelot, the medical attendant to the Queen of Sweden, he had seen a kind of insect by means of the microscope in luetic ulcers.¹ 'These little animals', he adds, 'have the appearance and slow movement of snails,' and this, he considers, explains why it is that in the major pox the infection is by contact alone, whereas in small-pox, with its flying germs, the infection may be through the air. Guide, however, adopting a view which we meet again and again for the next two hundred years, regards these 'insects' not as the cause but as the effect of the disease.

The theory in those days, as in these, had its fantastic developments, and a number of writers were seized with a sort of vermicular obsession. None of them, perhaps, was more quaint than the erudite Paullini, the author of *Cynographia Curiosa* (1685). In that work, and in many others, he gives rein to his strange mediæval fancy, and lets loose on his reader whole kennels full of perverted learning. He sees worms everywhere, both in health and disease, in the hair, eyes, ears, nostrils, teeth, trachea, breast, heart, lungs, semen, urine. The fermentation of yeast is alive and full of little worms, and these little creatures are the cause of phthisis, puerperal fever, sweating sickness, measles, small-pox, and cancer, to say nothing of headache, bewitchment, convulsions, and all the evils that Pandora's box contained. 'And are not worms', he asks, 'the instruments of God's just anger? Was not the manna that the Israelites ate in the desert also verminous? Did not the gourd of Jonah become a victim of worms, as was also the wretched body of the wicked Antiochus? Even the great King of Israel was pursued by the same fate, for it is said: "Behold, I am a worm and no man." ' Views such as those of Paullini form, of course, but a caricature of the position of his more sober and scientific contemporaries; they are quoted as affording a good example of the kind of expression which threw discredit on the whole microbic theory of disease, and led to a retrograde movement that extended from about the year 1725 until well into the nineteenth century.

A more judicious supporter of the theory was Theodore Kerckring, who published his *Spicilegium Anatomicum* at Amsterdam in 1670. Kerckring had come in contact with the philosopher and spectacle-maker, Spinoza, who, he says, had given him a splendid microscope. 'Doctors', he considered, 'should use every possible aid to diagnosis, and an excellent one is the microscope, which is now made better than ever before. With its aid', he says, 'it is easy to see the intestine as well as the liver and other solid organs swarming with innumerable minute animalculæ. One hardly knows whether these corrupt the body by their incessant motion or whether they preserve it.' Here is an advance in pathology in a direction similar to that made by Malpighi and by Leeuwenhoek, whose epoch-making work was appearing at about this time. Immense,

¹ Sieur le Guide, *Traité de la nature du mal vénérien*, Paris, 1676. In the form of a letter to Bourdelot.

however, as was the influence of these two latter writers in displacing the doctrine of spontaneous generation, drawing attention to the minute structure of the organs and demonstrating the multiplicity of microscopic life, they hardly directly touched the theory with which we are at the moment concerned.

The advent of views so novel and so imperfectly demonstrated as Kircher's was bound to draw ample criticism. As we have already pointed out, this in large measure took the form of regarding the minute organisms as the result rather than the cause of disease. Many writers again, as, for example, Nathaniel Hodges, who wrote an excellent work on the plague of London, engaged in a naïve search for macroscopic insects in the excreta and discharges of the sick, a search which had naturally negative results.¹ Among the unscientific adherents of the theory we may mention the novelist, Daniel Defoe.²

The progress of scientific knowledge has been compared to the erection of a great building in which no part of the general structure can go far without due attention being given to the other parts. Although the doctrine of spontaneous generation is compatible with a belief in living contagion, this latter belief could not be largely developed until a more sound idea had been attained of the origin of living things. For the establishment of this truer view it was first necessary to demolish existing errors, and so we find the main part of this work done by men of sceptical and destructive rather than experimental and constructive minds. Thus it comes about that no chapter in the history of science exhibits more happily the need of the scholar in the scientific economy.

Towards the middle of the seventeenth century—the most learned portion of what was essentially *the* learned century—appeared a number of writers who combined to an unusual degree a knowledge of the past with an interest in the progress of material science. The combination of the two sources yields a special type of scientific doubt associated with a rare power of expression. Such writers were really exceedingly numerous at the period, but we will mention only two typical examples, who strangely resembled each other in many ways, the Italian, Francesco Redi, and our own Sir Thomas Browne. Both were poets and stylists (though one used verse and the other prose as his medium), both were scholars, both observers, and both realized fully the meaning of their own simple experiments, although this side of Browne's work has been unfairly neglected. Both were loyal sons of the Church into which they were born. In both a peculiar intellectual conservatism and aloofness was combined with mental qualities which should give them a place in the history of science. We must not further pursue the analogy. Redi, to whom is attributed the honour of having slain the doctrine of spontaneous generation, was really only one member, albeit doubtless

¹ Nathaniel Hodges, *Loimologia; or an Historical Account of the Plague in London in 1665*, by J. Quincey, London, 1720.

² Daniel Defoe (H. F.), *Journal of the Plague Year*, London, 1720.

the most valuable, of a considerable school. Since, however, tradition has bound up the name of Redi and the theory that we are discussing we must for the moment leave it there. It is certain that one of his greatest merits is an extraordinary clearness and exactness in the use of language. Redi was not himself addicted to the use of the microscope, though he was aware of some of its revelations, and his own war against spontaneous generation must, therefore, be regarded as a brilliant generalization on analogical reasoning rather than a true induction on an experimental basis. Indeed, on the subject of intestinal parasites, as well as on galls, he shows signs of weakening in doctrine. His attitude towards galls appears to us inferior to that of his contemporary, Malpighi. It was rather the patient and exact observations of Leeuwenhoek on the generation and development of the flea and of the eel that gave an acceptable turn to the views which Redi propounded.

Until Redi's time the belief in equivocal generation was universal. The real work of his school is summed up by saying that they left the best scientific opinion of the world biased against the belief, the exceptions being classed among those things for which an explanation must be sought rather than those things that were inexplicable. Neither the doctrine of a *contagium vivum* nor the allied doctrine of the specificity of infections could find a firm intellectual basis while the doctrine of spontaneous generation was in the ascendant.

At the turn of the seventeenth century the minute structure of the body of man and of animals was being industriously studied, and the work of Malpighi and Leeuwenhoek was being extended by Ruysch, Regnier de Graaf, Hartsoeker, Borelli, Swammerdam, and many others. Accumulating discoveries gave a stimulus to theoretical writing, and the first twenty-five years of the eighteenth century are, of all periods before Pasteur, the most fertile in works bearing on the subject of our essay.

In 1700 Nicholas Andry¹ brought out an essay on worms in the human body. Andry was a credulous and indifferent writer, whose work has drawn far more attention than it deserves. His accounts and figures of worms are often ridiculous, and sometimes copied without acknowledgement from earlier writers. Like many before him, he confuses microscopic organisms—which he regards as the cause of infection—with macroscopic worms, and he falls into the ancient pitfall of spontaneous generation. Very different from this was the splendid work of Lancisi.² Working in a malarious country, he clearly grasped a relationship between gnats and malarial fever. He traced accurately the course of development and life-history of these pernicious insects, and he came very near modern views on the nature of malarial and plague infections.

¹ Nicholas Andry de Boisregard, *De la génération des vers dans le corps de l'homme*, avec trois lettres . . . sur le sujet des vers : les deux premières par N. Hartsoeker, et l'autre par G. Baglivi, Paris, 1700.

² Giovanni Maria Lancisi, *De Noxiis Paludum Effluviis*, Geneva, 1718, and previous works.

Accepting the view that minute creatures are related to infection, he suggests that worms or insects are but the carriers of the true plague, and that such diseases arise not from worms or insects themselves nesting in our blood, but from the 'organic effluvia' carried by them, which 'ferment' within us. As to the exact nature of the 'organic effluvia' or 'ferments', Lancisi suspends judgement until wider and more careful microscopic experiments have been made, although he is well aware that the power of spontaneous multiplication presented by these 'ferments' partakes of the nature of life. Lancisi thus represents the high-water mark of philosophical speculation before the actual demonstration of the real organic cause of febrile disease. Meanwhile Vallisnieri attributed disease of man and beast to vermicules and had many Italian adherents. Throughout the eighteenth century current views of infection are usually inferior to those of Lancisi and Vallisnieri, and although some writers, aided by a lucky guess, reached nearer the modern view, nevertheless they represent the best opinion of the early eighteenth century.

Several other contemporary writers were, however, able to advance the theory to which new observations on the organism of scabies gave a fresh impetus. The itch mite had been already correctly figured, and its life habits investigated as long ago as 1682 by Etmuller.¹ The work had been disregarded, but the publication of the well-known correspondence between Bonomo and Cestoni with Redi and Vallisnieri² brought the cause of the disease into notice. Vallisnieri³ and his school soon seized on the analogy between scabies and the febrile diseases, and drew the obvious conclusion. Vallisnieri obtained a good view of the corpuscles of the blood, and was, as we believe, the first to distinguish white from red corpuscles. He has also the merit of clearly realizing that the minute organisms which he believed to be the actual cause of infection were of an altogether different nature to the microscopic infusoria with which he was acquainted. He appears, however, like numbers before and after him, to have regarded the corpuscles of the blood as the cause of disease. A similar error was made by Raiberti,⁴ who regarded the spermatozoa as the efficient agent of syphilis.

Passing over a large number of writers who gave various presentations of our theory with varying degrees of success, we come to the year 1720, the date of the famous outbreak of plague at Marseilles. At that time Europe had long been free from the scourge, and the approach of the ancient enemy of the human race raised universal apprehension and

¹ Michael Etmuller in *Acta Eruditorum*, Leipzig, 1682.

² For a modern account of this correspondence see M. H. F. Fuerstenberg, *Die Krätzmilben der Menschen und Thiere*, Leipzig, 1861.

³ Antonio Vallisnieri (the elder), *Dialoghe . . . sopra la curiosa origine di molti insetti*, Venice, 1700; *Nuove osservazioni all' ovaja scoperta ne' vermi tondi dell' uomo*, Padua, 1713; *Considerazioni ed esperienze intorno alla generazione de' vermi ordinari del corpo umano*, Padua, 1710; *Lettere critiche . . . contra le opere del Sig. Andry*, Venice, 1721, and other works. See also *Opere fisico-mediche*, 3 vols, Venice, 1733.

⁴ J. H. Raiberti, *Dissertatio medica de morbis venereis*, Rome, 1722.

interest. A vast literature arose on the subject in the language of every Western country, and numerous were the measures suggested to prevent the spread of the disease. At the same time there was a large amount of speculative activity directed towards establishing a workable hypothesis as to the nature of the infection, and we find the years 1720-25 peculiarly rich in this type of publication. From among this large literature we shall select only three names for discussion, the Englishmen, Benjamin Marten and Richard Bradley, and the Frenchman, J. B. Goiffon. The first we will dismiss in a few words, as we have already given an account of his work elsewhere.¹ More by luck than by wit he succeeded in evolving a most reasonable theory of the nature of consumption, in which there is even to this day little to correct. He was, so far as one can see, devoid of originality, but his solitary work shows him to have had well-developed selective and critical powers, which enabled him to piece together the best elements in the writings of others.

In 1721, the year after the appearance of Marten's work, appeared a small book on 'The Plague at Marseilles', by Richard Bradley.² This we regard as, on the whole, the best attempt to solve the problem of the nature of infection by any writer previous to Pasteur. Less philosophical than either Lancisi or Vallisneri, he had the advantage of writing at a slightly later date, when the theories put forward by the two brilliant Italians were still in men's minds. The solution arrived at by Bradley is not quite as complete as that of Marten. On the other hand, he shows vastly more first-hand knowledge, and his views are better reasoned and less the result of accident than those of his contemporary. Bradley is a greatly neglected writer, and even apart from his views on plague, he is one who well repays study. He was a botanist, and certainly had inklings of the part played by insects in the fertilization of plants, as well as of the sex character of flowers. It was the epidemics of macroscopic insects in plants that gave Bradley the clue to the nature of infection, just as it was his knowledge of the *Acarus scabiei* that helped Marten to his views.

The last, and perhaps the most remarkable, of the little group was Jean Baptiste Goiffon (1658-1730). Goiffon was chief of the Board of Health at Marseilles at the time of the plague. Independently of the two English writers we have quoted, he arrived at a closely similar view of living contagion, and his works gave rise to considerable literature.³

From this time onward the history of the theory throughout the eighteenth century is one of progressive degradation—a process assisted

¹ Benjamin Marten, *A New Theory of Consumptions*, London, 1720. See Charles Singer, in *Janus*, February 1911, and *Lancet*, March 1911.

² Richard Bradley, *The Plague at Marseilles considered*, London, 1721. Another edition appeared in the same year at Dublin.

³ Jean Baptiste Goiffon, 'Avertissement' in *Observations faites sur la peste qui règne à présent à Marseille et dans la Provence*, by Bertrand Lyon, 1721; also *Relation et Dissertation sur la peste du Gevaudan*, Lyon, 1722.

by the publication of several absurd books in its support. The excellent work on 'Antiseptics', by Pringle and his followers, about the middle of the century, hardly comes within our purview. The theory had a silver age under Plenciz¹ about 1760, and was travestied by Linnæus² and his pupils, who regarded infectious diseases as caused by different types of *Acarus*. Scuderi,³ in Italy, towards the end of the century, set forth the view with some force, but we believe it is true to say that from the year 1725 nothing of real value on the subject appeared until the independent development of the theory by the group of nineteenth-century writers, of whom Pasteur is the crowning glory.

Our theory therefore presents the interesting phenomenon of being at least three times revived within the course of history—firstly, among the ancients of classical antiquity, with whom our time has not permitted us to deal; secondly, among the investigators towards the end of the seventeenth and beginning of the eighteenth century; and for the third time in the modern period.

¹ Marcus Antonius Plenciz, *Opera Medico-Physica . . . Contagii Morborum Ideam Novam*, Vienna, 1762.

² Linnæus, see *Fauna Suecica*, 1746, also Michael Bæckner in *Thesis Insectorum*, Holm, 1752, and Johannes Nyander in *Thesis Exanthemata Viva*, Upsala, 1757.

³ Francisco Maria Scuderi, *De Variolarum Morborumque contagiosorum*, Naples, 1789.

[Friday Afternoon, August 8]

SECTION XXIII HISTORY OF MEDICINE

INDEPENDENT PAPER

GRÆCO-ROMAN SURGICAL INSTRUMENTS REPRESENTED IN EGYPTIAN SCULPTURE

By HENRY S. WELLCOME

WHEN in Egypt in 1910, I noticed and photographed an interesting incised sculptured stone-tablet in the Temple at Kôm-Ombos, situate on the Nile, 900 kilometres south of Cairo. It consists of representations of a number of gynæcological instruments.

Kôm-Ombos marks the site of the ancient Egyptian city of Pa-Sebek, 'the House of Sebek,' where the Crocodile god was worshipped, together with the Hawk-headed Horus, called Heru-Ur, or 'the Greater Horus,' the Aroueris of the Greeks. This great temple was built by Ptolemy VII, 181-146 B.C., but there were traces of an earlier building in the form of a sandstone gateway, built by Thothmes III, and dedicated to the god Sebek, which dates, therefore, from 1600 B.C.

The temple was built on a broad terrace which ran along the river bank facing south. On this terrace were a propylon and a small temple built by the Roman Emperor Domitian, about A. D. 83, whose cartouches appear on the walls. They are written in a peculiar hieroglyphic form, and read : 'Domitianus who defendeth.'

Near to the temple of Domitian are the ruins, now in a very fragmentary state, of a small sacred building, which, from the inscriptions, appears to have been built by or for Ptolemy IX, or Euergetes II, about 146 B.C.

The sculptures which remain from this edifice show that it was one of those structures peculiar to Egyptian religious architecture, called 'the Mammisi,' or 'Birth House,' a building which commemorated the 'Divine Birth of the King.'

The Mammisis, in the form in which we find them at Philæ, Edfu, Abydos, Esneh and Kôm-Ombos, were essentially of Ptolemaic or Roman character, although their origin can be traced back to the representations depicted in the Egyptian temples of the eighteenth dynasty, 1600 B.C., which represent the birth of the king or queen as the divine offspring of Amen-Ra. Such representations are found on the walls of the Theban temples of Deir-el-Bahari, built by the great Queen Hatshepsu, 1600 B.C., and of Amenophis III, at Karnak. The scenes there depicted show the visit of the god Amen-Ra in human form to the queen-mother,

the accouchement of the queen attended by Hathor, and the presentation of the child to his divine parents.

The Theban birth sculptures have a regular historical sequence, and tell a somewhat complete story, but the Ptolemaic 'Birth House' belongs to a period when the religious cults in Egypt were very confused and often mixed with Greek ideas and symbolism, which renders them very difficult of explanation.

The sculpture of special interest in the 'Birth House' at Kôm-Ombos represents a seated deity, who forms the central figure (Fig. 1). Unfortunately the head is missing, but, judging from other fragments of sculpture in the vicinity, it may be reasonably assumed to represent the hawk-headed Heru-Ur. Behind him stands a perfect figure of a female deity, with one hand uplifted, and in the other holding the *ankh*, the Symbol of Life.



FIG. 1. Sculptured wall in the Birth House at Kôm-Ombos, showing a surgical instrument cabinet in the centre.

This undoubtedly represents Isis, as the long three-lined inscription in the centre of the tablet is addressed to that goddess.

Before the seated male divinity is a tall incense burner and a table altar. In the left-hand portion in front of the latter is a greater figure, probably representing a kneeling king, who wears a peculiar girdle about his waist, the ends of which terminate in the heads of Uræi serpents. He kneels before two shrine-shaped altars, on which are seated figures of Isis and Nephthys. Behind him is a similar shrine-shaped altar on which stands a large Utchat Eye, which has a figure of the Hawk of Horus on the lower lash. In front of this is an inscription, the translation of which reads: 'Making his way to the House of Joy. These are the words.' Followed by the second: 'All power and life around him, like Ra eternally.'

The important and most interesting part of the sculpture, from a medical point of view, however, is the altar in front of the seated deity, on which stands an upright panel, divided into four compartments or divisions (Fig. 2). This panel is probably intended to represent a surgical instrument cabinet, each compartment of which contains a number of gynecological instruments, which were employed in midwifery in

Ptolemaic times. That these instruments are not strictly Egyptian may be gathered from the fact that the tablet and sculpture probably do not date back further than about 150 B.C., but that they are of an extremely interesting nature may be judged from the following detailed description.

Although we have but meagre evidence of surgical instruments being used in obstetrics in ancient times, there can be little doubt that these sculptures depict the instruments used at accouchements by the Græco-Roman accoucheurs of the period, and probably also by Egyptians under Græco-Roman influence.

Beginning with the top compartment from the left-hand side, the instruments appear to be :—

First Division.

1. A bifurcated probe.
2. A spoon.
3. A knife, for cutting the umbilicus.
- 4 and 5. Probes.
6. A cautery.
7. (Above). A bifurcated probe.
8. (Below). A pessary. (At this period pessaries were made of horn, ivory, bone or bronze.)
9. A saw.
10. A cautery.
11. A bandage or roll of linen, used for swathing or binding the infant. This swathing bandage is an interesting emblem, which is often figured in connexion with Ta-Urt, or Thoueris, the 'Hippopotamus goddess,' who was the Egyptian protectress of pregnant women.
12. Possibly a vaginal speculum.
13. Curved retractors.

Second Division.

1. (Horizontal). A bifurcated probe with hooked end.
- 1A. Unidentified.
- 2 and 3. Traction hooks or decapitators.
- 4, 5 and 6. Scalpels.
7. Appears to represent a pair of obstetric forceps, and is of special interest, as no specimens of Greek forceps of this character are known. It has been doubted that the Greeks ever used instruments in cases of difficult labour, but Adams, commenting in a note on Paul of Ægina, states: 'Though they, the Roman and Greek writers, do not mention the forceps, Avicenna does so, and says that a forceps was dug up in the house of an obstetrix at Pompeii, bearing a considerable resemblance to the modern forceps.' The sculptured representation will be noticed to bear a very close resemblance to forceps that were in use a few years ago.
8. A cranioclast or forceps for crushing the head.
9. A pointed spatula for incising the head.
10. A drill for excising a piece of bone from the skull.
11. A curved knife.
12. Unidentified.
13. Unidentified.

Third Division.

- 1 and 2. Cranioclasts or forceps for crushing the head.
- 3 and 4. Two very interesting objects, consisting of bags or vases, each of which is placed near a Uchat Eye. These are believed to represent drugs or unguents, called 'Uchat,' or 'the Eye of Horus,' which may have been symbolic of an ointment for application to the eyes of the infants.
5. (Beneath the Uchat eyes). A strigil, which may have been used as a uterine curette.
6. (Above). A weighing balance.
- 7 and 8. (Below). Two plants, probably representing those used medicinally in obstetric cases.



FIG. 2.

Fourth Division.

- 1 and 2. Cupping vessels.
3. A portable case for surgical instruments.
4. Shears.
- 5 and 6. Two oblong tablets unidentified.
7. A sponge.
- 8 and 9. Probes.
- 10 and 11. Scalpels.

The long inscription over the incense altar in front of Heru-Ur, or Aroueris appears to be a list of offerings or products brought at the time of the accouchement from various cities. Translated it reads :—



' . . . the House of Hapi (the Nile).
 One half henen-Suten (Heracleopolis).
 Half and . . . cloth (?) or wax (?) of the House of Spirit of Mendei.
 One third (of) the city of Annu (Heliopolis).
 One eighth (of) Memphis.
 One eighth (for) Pa or Het-Resi.
 One fourth (for) Sessenu-Khemensi (Hermopolis).
 One sixth (for) Neti.
 One hundred and twenty-eighth part (for) Abdu (Abydos).'

FIG. 3.

This would seem to be an inventory of some special offerings, probably to the god Heru-Ur at the time of the birth, but owing to the inscription having crumbled away and becoming partly obliterated, a number of the lines also being missing, it is impossible to make a complete translation. That the objects were offered, there seems little doubt from the short inscription incised between the seated god and Isis, which reads : 'May there be given to them in every place established in the Light of Ra (daily) in (before) their faces, gifts and offerings.'

So far as I can learn, we have, in this most interesting piece of sculpture, the only complete and authentic representations of instruments used in gynæcology in Egypt in Ptolemaic times.

An attempt has been made to reconstruct the instrument cabinet and to present models of the instruments in the Historical Medical Museum of the Congress in Wigmore Street.

I have not been able to discover any record previous to my photograph and identification in 1910 of this tablet, except a sketch by De Morgan, in which some of the objects are missing from the tablet. He does not appear to have identified the instruments.

[Friday Afternoon, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

I TITOLI SEPOLCRALI DEI MEDICI CRISTIANI
DELLE CATACOMBE DI ROMA

PER IL DOTTORE PIETRO CAPPARONI

GLI antichi romani al dire di Plinio non ebbero medici prima del III^o secolo a. C. ed il primo medico che venne in Roma e vi fu accolto con grande entusiasmo fu un Greco, Arcagato del Peloponneso, figlio di Lisania e precisamente nel 535 di Roma (219 a. C.). Gli venne data la facoltà di esercitare ed ebbe una bottega nel Foro *in compito Acilio*. Però non tutti accettano come esatta questa data riferitaci da Plinio, giacchè si sa che fin dal tempo di Silla la medicina greca aveva preso definitivamente possesso di Roma, tanto che l'esercizio medico ebbe i suoi pubblici regolamenti. I medici greci che esercitavano in Roma erano o uomini liberi che andavano da una città all'altra vivendo con il loro esercizio professionale (*περιοδευταί*) oppure schiavi o liberti. Nei primi tempi, Romani liberi che esercitassero la medicina non ne troviamo. Il trovare un medico con un nome latino non significa che questi fosse romano, giacchè poteva essere un liberto ed in questo caso doveva portare il nome del padrone. Gli allievi che questi medici greci fecero tra i romani sotto la repubblica o l'alto impero furono tutti degli schiavi, dei quali molti in appresso vennero affrancati.

Anche posteriormente e cioè dal 2^o al 6^o secolo d. C., come vedremo dalle lapidi sepolcrali dei medici cristiani, noi troviamo molti nomi greci, il che fa vedere come ancora una buona parte dei sanitari venisse di làggìù. Le famiglie signorili avevano tra i loro schiavi anche lo schiavo medico che serviva per la famiglia e per la servitù ed a cui era vietato curare persone estranee, salvo uno speciale permesso del padrone. Esso era chiamato servo medico, *domesticus seu familiaris medicus*. Nelle più cospicue famiglie, dove esistevano più servi medici, a questi era preposto un sovrastante, una specie di ispettore, chiamato *Superpositus medicorum* o *Supramedicos*. Liberati per benemerienze dalla schiavitù questi schiavi che esercitavano la medicina, erano chiamati *liberti medici*. Coloro che per i primi dalla Galilea vennero a Roma a predicare la religione di Cristo, trovarono che le classi in cui le nuove idee fecero maggior breccia furono quelle degli schiavi, dei servi e degli operai, giacchè questi umili ben

presto furono attratti dalle nuove idee religiose che vennero a sconvolgere radicalmente le vecchie idee romane di etica e di morale, colla fraternità, con l'uguaglianza e con la penitenza. E siccome in quei tempi, come abbiamo detto, la medicina in Roma per la maggior parte era esercitata dagli schiavi, così si può fare una fondata supposizione pensando che molti di loro dovessero abbracciare il Cristianesimo. Una prova diretta non ne abbiamo, giacchè scarsissime sono le iscrizioni sepolcrali del primo e del secondo secolo nelle nostre Catacombe romane ed anche quando i loculi portano iscrizioni da queste non si rileva mai il nome o la professione del defunto; ma solo vi troviamo un'acclamazione, un'espressione di pio desiderio, una benedizione nel Signore, o il giorno della deposizione del defunto.

Dal numero relativamente grande di iscrizioni sepolcrali di medici cristiani che noi troviamo nel III^o nel IV^o, e nel V^o secolo ci è dato inferire che tra i medici dei primi secoli dell'era volgare molti debbano aver abbracciato il Cristianesimo. Dico numero grande relativamente, giacchè anche in questi secoli posteriori poco era in uso porre sulle lapidi gli attributi professionali. Però il numero di lapidi sepolcrali di medici comparato con quello di altri professionisti o di esercenti mestieri od arti è sempre di gran lunga superiore. Queste lapidi sepolcrali, che sono documenti di altissima importanza per la storia privata dei medici cristiani dei primi secoli, si trovano sparse nelle Catacombe di Roma, o raccolte nei musei. Molte altre di queste iscrizioni, presentemente perdute, si trovano fortunatamente trascritte nelle sillogi degli antichi autori di epigrafia. Ho pensato quindi che non sarebbe inutile raccoglierle insieme, unitamente a quanto nelle Catacombe romane si ha che possa connettersi alla storia della Medicina nei primi sette secoli dell'era volgare. Tutto questo materiale quindi può esser diviso in quattro grandi sezioni.

- (A) Pitture cimiteriali.
- (B) Pietre tombali anepigrafiche.
- (C) Pietre tombali con iscrizioni greche.
- (D) Pietre tombali con iscrizioni latine.

Pitture cimiteriali. L'unica pittura delle Catacombe di Roma che abbia un rapporto con la storia della Medicina è una pittura ad affresco esistente nella basilica sotterranea dei SS. Felice ed Adauto nel cimitero di Comodilla sulla Via Ostiense. Sebbene posteriore al vero periodo cimiteriale, il quale secondo G. B. De Rossi termina l'anno 410, pure è di grandissimo interesse. Essa è del secolo 7^o e può ascriversi al periodo che va dal 668 al 685, come si rileva dall'iscrizione alla sua base, che la dice fatta ai tempi di Costantino Pogonato. Essa rappresenta S. Luca vestito della tunica e pallio ed effigiato, come evangelista perchè tiene nella mano destra il rotolo e come medico tenendo nella sinistra una borsa di cuoio dai lunghi cordoni, che contiene 4 strumenti chirurgici tra i quali una lancetta. Ai due lati della testa del santo rimangono

ancora tracce dell' iscrizione $\overline{\text{SCS}} \text{ LVCAS}$ e nella cornice inferiore ed in parte nella laterale destra si legge :

✠ · SVB TEMPORA CONSTANTINV AVGSTO N FACTVM EST

È l' unica pittura delle Catacombe che ci rappresenta S. Luca come medico ed è interessantissima, come dicevo, per la storia del costume e degli istrumenti chirurgici. È stata illustrata dal Wilpert.¹

Pietre tombali anepigrafiche. Nella parete 16ª del Museo Cristiano Pio Lateranense in Roma esiste una lastra marmorea, certamente frammento di una lastra per chiusura di loculo, proveniente dal Cimitero di Pretestato sulla Via Ardeatina. Non ha alcuna iscrizione, ma a titolo di riconoscimento porta scolpita nel marmo una busta contenente istrumenti chirurgici. Il sepolcro quindi doveva appartenere ad un chirurgo che malauguratamente ci rimane sconosciuto. La busta è raffigurata aperta e nell' interno in bell' ordine appaiono gl' istrumenti. Tra questi si trovano una lancetta, due taglienti, una pinza da denti, una coppetta, un' enema, un cucchiaino da sanguigna ed un istrumento di incerto uso. Questa pietra tombale appartiene al periodo in cui nelle Catacombe non si usava porre il nome del defunto. È quindi molto antica e possiamo ascriverla ad un' epoca che vada dalla fine del 2º al principio del 4º secolo. I ferri contenuti nella busta sono i classici ed io di tutti ne possiedo gli originali nella mia collezione di istrumenti chirurgici greco-romani. Questa pietra tombale è stata illustrata dal Marucchi.²

Pietre tombali con iscrizioni greche. La medicina è una professione che noi troviamo nell' antico Cristianesimo facilmente associata al sacerdozio, quasi direi a ricordo dell' antica medicina pagana sacerdotale. Ne fa fede la seguente iscrizione tombale

ΔΙΟΝΥΧΙΟΥ
ΙΑΤΡΟΥ
ΠΡΕΒΥΤΕΡΟΥ

Quest' epigrafe è antichissima e si può per data attribuire alla fine del IIIº o al principio del IVº secolo. Per la lingua e per il nome sta a provare come in Roma la Medicina fosse ancora per la maggior parte esercitata da individui di nazionalità ellenica. Essa presentemente trovasi murata nella parete Xª del Museo Cristiano Pio Lateranense, ma fu rinvenuta nel cimitero di Callisto sulla Via Appia Antica nell' ingresso della Cripta di S. Cornelio.³

Le seguenti due iscrizioni, interessantissime per la storia della Medicina, ricordano due medici greci della scuola dei pneumatici. Pneumatici vennero detti gli Asclepiadisti metodici seguaci d' Erasistrato. Questa setta medica fiorì nel secondo e nel terzo secolo. Essi attribuivano al $\piνεύμα$, parola vaga colla quale si può intendere tanto la parte inorganica

¹ Bollettino d' Archeologia Cristiana, 1904, pag. 170.

² I monumenti del Museo Cristiano Pio Lateranense, Milano, Ulrico Hoepli, 1910, Tav. 59, N° 22, parete 16.

³ Marucchi, loc. cit., tavola 53, parete x, N° 10.

del corpo umano, quanto l'aria che ci circonda, la più importante influenza sull'economia animale, tanto allo stato sano quanto in quello patologico. In Roma i principali suoi seguaci furono Ateneo d'Attalia, che vi fondò la scuola nel I° secolo, Archigene d'Apamea, che vi fiorì al tempo di Traiano, Areteo di Cappadocia, Filippo di Cesarea, Magno d'Efeso, Claudio Aureliano, il chirurgo Eliodoro, Niceta, Possidonio, Filargirio, Erodoto, Cassio, Antillo e molti altri.

La prima dunque di queste iscrizioni sepolcrali di medici cristiani pneumatici, benchè non porti l'attributo di *Χριστιανός*, pure è indubbiamente cristiana deducendosi ciò dallo stile epigrafico, dalla colomba e dalla formula *in pace*. Essa dice :



ΕΝΘΑΔΕ · ΚΑΤΑΚΕΙΤΑΙ · ΑΒΛΑΒΗΣ
ΓΑΛΑΤΗΣ · ΧΩΡΙΟΥ · ΜΟΥΛΛΙΚΟΛΛΟΥ ·
ΦΩΤΙΝΟΥ · ΖΙΣΑΣ · ΕΤΗ · ΤΡΙΑΚΟΝΤΑ
ΠΝΕΥΜΑΤΙΚΟΣ · ΚΑΛΥΠΤΕΙ · ΓΗ · ΕΙΡΗΝΗ · ΣΟΙ

Qui riposa Ablabio (Innocente) Galata del Castello di Mollicio di Fotino : visse anni 30 pneumatico, la terra lo ricopre. Pace a lui !

L'iscrizione appartiene al IV° o tutt' al più al principio del V° secolo e fu scoperta nel 1714 nel cimitero di Calepodio, sulla Via Aurelia, corrispondente sulla chiesa di S. Pancrazio. Fu edita dal Boldetti.¹ Esiste anche nel *Corpus Inscriptionum Graecarum*.²

Ora di quanto valore non è questa iscrizione e per il ricordo del medico galata e perchè ci dice come ancora nel secolo IV° o al principio del V°, al qual tempo come ho detto essa appartiene, ancora molti medici a Roma provenissero dalle province greche dell' Asia minore e come ancora vivesse la setta dei Pneumatici ? Nell' Asia minore brillarono le scuole di Pergamo e di Smirne e fino al IV° secolo l' aver studiato ad Alessandria era un titolo di raccomandazione. Io qui credo che *Γαλάτης* debba intendersi senza dubbio per Galata della provincia greca dell'Asia minore e non ritengo giusta l'opinione del Nicolai, secondo la quale i Greci chiamarono *Γαλατία* la Gallia e *Μικρά Γαλατία* ovvero *Γαλατία Ελληνική* la provincia greca Galata dell' Asia minore. Il nostro medico Ablabio, quando morì, cioè a 30 anni, si trovava già con 10 anni di pratica professionale, giacchè per testimonianza di Sorano, nella sua *Isagoge in artem medicam*, sappiamo ; che nel basso impero gli studi medici duravano 5 anni, cominciando cioè a 15 e terminando a 20. Il Boldetti che fu lo scopritore e per il primo lesse l' epigrafe, non dette affatto la conveniente interpretazione all' aggettivo *πνευματικός* che fu poi giustamente interpretato dal Kirkloff nella seguente iscrizione, che è la seconda che riguarda un medico cristiano pneumatico.

ΕΝΘΑΔΕ · ΚΕΙΑΙ · ΑΛΕΞΑΝΔΡΟΣ ·
ΙΑΤΡΟΣ · ΧΡΙΣΤΙΑΝΟΣ · ΚΑΙ
ΠΝΕΥΜΑΤΙΚΟΣ ·

¹ Osservazioni sopra i cimiteri dei SS. Martiri, lib. 2°, capo 6°, pag. 412.

² *Corpus Inscriptionum Graecarum*, Berlino, 1877, N° 9578.

Qui riposa Alessandro medico cristiano e pneumatico.

Anche questa seconda iscrizione appartiene ad un lasso di tempo che può andare dal IV^o secolo ai principi del V^o. Essa fu ricavata dalle schede dell' Holsten, che la dice esistente in Roma ' in regione Transtiberina '.¹ Il Kirkloff, come sopra dicevo, spiega la parola *πνευματικός* nel suo vero senso di medico cioè appartenente alla setta dei pneumatici. La stessa spiegazione è data nel grande Dizionario della lingua greca di Enrico Stefano,² ove si dice: *Πνευματικοί* dicti sunt et medici quidam qui, a flatu sive spiritu in corpora subeunte, omnia vel secundam naturam se habere, vel in morbos incidere censebant (v. Galenus Vol 2^o pag. 368; ibid. Vol. 8^o pag. 97).

Il pavimento dell' antica basilica di S. Paolo sulla Via Ostiense ci ha conservata quest' altra iscrizione greca di un medico della Celesiria, contrada posta nella profonda valle compresa fra il Libano e l' Antilibano e che ora è un Sangiaccato turco della Siria. L' iscrizione è della seconda metà del secolo IV^o o del secolo V^o. Esisteva nel pavimento dell' antica basilica, tra la seconda e la terza colonna e tra questa e l' altare. Probabilmente quest' iscrizione proveniva dal Cimitero di Lucina, ove fu sepolto l' apostolo Paolo e sul cui luogo fu costruita la primitiva Basilica Costantiniana. Fu edita dal Margarini³ ed è riportata nel *Corpus Inscriptionum Graecarum*.⁴

Essa dice che il medico Aurelio della Celesiria pensò, vivente, di farsi un sepolcro in vista delle sue malattie, *ἐκ τῶν ιδίων μου καμάτων*. Ed eccola nella sua integrità con i molteplici errori del quadratario e mancante di molte parti, essendo essa frammentata

ΑΥΡΗΛΙΟΣ ΙΑ CCEA ONTO
ΚΟΙΛΗC CYPIAC · ΟΥΤΟΝΤ ΩΜΙ
ΕΠΟΗC ΛΕΑ ΤΩ ΕΚ Ν
ΩΝΜΟΥ ΚΑΜΑΤΟ

Essa può essere ricostruita così :

Αὐρήλιος ἰατρὸς ἀπο
κοίλης συρίας τοῦτον τὸν τύμβον
ἐπόησα ἑαυτῷ ἐκ τῶν ιδίων μου
καμάτων

Non dovrei citare l' iscrizione seguente perchè non esistente in Roma, ma essa serve a completare la Silloge delle iscrizioni dei medici cristiani. Essa fu trovata a Gozo presso l' isola di Malta e fu edita dal Castelli che la copiò dalle schede del Conte Io. Ant. Ciantar. È riportata anche dal Kaibel e nel *Corpus Inscriptionum Graecarum*.⁵ Interessantissima perchè ricorda un *medicus domesticus*, servo medico che come abbiamo detto esercitava nelle grandi famiglie; sotto l' iscrizione troviamo la raffigura-

¹ C. I. G., vol. 4^o, parte xl, pag. 562, N^o 9792.

² *Thesaurus Graecae Linguae*, Parigi, Firmin Didot, 1842-7, vol. 6^o, pag. 1256.

³ loc. cit., N^o 50.

⁴ C. I. G., N^o 9777.

⁵ Castelli, *Siciliae veteres inscriptiones*, xvii, N^o 24, pag. 247; Kaibel, *Inscriptiones Graecae*, N^o 604; C. I. G., N^o 9451.

zione di due istrumenti chirurgici. Per epoca va dalla metà del IV^o al principio del V^o secolo

ΕΝΘΑΕΚΙΕΔΟΜΕ
 ΣΤΙΚΟΣΟΕΥΜΕΗ
 ΧΡΙΣΤΙΝ^ΟΚΙΗΤΡΟΣ
 ΕΖΗΕΝΕΤΗ ΟΣ
 ΑΝΕΠΑΪΑΤΟΤΗΓΙΗ
 ΚΑΛ·Δ·ΦΕΒΡΥ
 .Χ·Υ·

Ἐνθάδε κτε δομειστικὸς ὁ Εὐσεβὴς κριστιανὸς καὶ ιητρὸς ἔζησεν ἔτη ὅς ἀνεπαύσατο τῇ πρὸ ιη καιλανδον φεβρουαριον.

Il nostro Eusebio aveva servito a lungo nella casa del suo padrone, giacchè egli morì nell'età di 76 anni.

Verona ci dà quest'altra iscrizione.

Essa fu trovata nel 1889 nella casa parrocchiale della chiesa di S. Stefano. È in quattro pezzi. L'iscrizione in principio doveva misurare un metro e trenta di altezza per 0.60 di larghezza. La parte scritta è alta circa 92 centimetri; essa fu pubblicata dal Kaibel.⁶ Dell'interpretazione se ne occupò il Prof. Fraccaroli. È datata ed è cioè dell'anno 511, nel quale anno si ebbe in Occidente il consolato di Felice solo e cadde l'indizione 4^a. Il sepolcro conteneva il corpo del medico Pietro della città di Claudiapoli di anni 50.

1 ^o	2 ^o
ΕΝΘΑ	ΣΠΕ
ΠΑΥΜΕ	ΩΝΕΙ
ΟΥΣΕ	ΩΗΝΗ
ΩΝΟΜ	ΟΙΠΕ
ΤΡΟΣ	ΤΟΝΔΣ
ΙΗΤΗ	ΑΤΡΙΣ
ΜΟΙΚ	ΙΑΠΟ
3 ^o	4 ^o
ΛΙΣΔ	ΑΝΙΣ
ΤΑΕΒ	ΩΣΛΕ
ΤΗΝΤ	ΛΕΛΕ
ΙΜΕΟ	ΩΗΝΜ
ΑΥΓΙΝ	ΝΔΔΥ
ΦΕΙΛΙΚ	ΩΣ Ξ

L'epitaffio è stato così ricostruito :

Ἐνθάδε πέπαυμαι ωνειους
 ἐν εἰρήνῃ ὄνομα μοι πέτρος
 ἔργον δὲ ιητῆρ πατρίς μοι Κλαυ-
 διάπολις ἐβίωσα ἔτη ἢ πλέον ἔλαττον
 ἐκοιμήθην μηνὶ Αὐγούστῳ ἡνδικτιώνος δ' ὑπατεία φείλικος.

¹ Notizia degli scavi, anno 1889, pag. 353, vedi anche Kaibel, *Inscriptiones Graecae*.

Ed eccoci all' ultima lapide che chiude la serie dell' iscrizioni greche di medici cristiani. Essa è di uno straordinario interesse perchè ricorda un medico dell' ospedale di Zante. Essa fu trovata ad Halvan Czeleby presso Dervisos.¹ Fu edita dal Grutero che la ricavò dalle schede di Bousbek. Anche questa non può essere posteriore al secolo V° ma non può arrivare più in dietro della seconda metà del IV°.

ΘΕΣΙΣ · ΘΕΟΔ
ΩΡΟΥ · ΙΗΤΡΟΥ · ΞΑ
ΝΘΟΥ · ΤΟΥ · ΝΟCΟ
Κ · ΧΥΟΥ · ΚΑΙ · ΚΑΡ
ΣΟΥΝΒΙΟΥ · ΑΥΤΟ
Υ · Κ · ΤΩΝ · ΤΕΚΝΩ
Ν · ΑΥΤΩΝ ·

Il medico Teodoro dell' ospedale di Zante aveva fatto il sepolcro per sè, e τῶν τέκνων αὐτῶν, cioè per tutta la famiglia ospitaliera. Gli ospedali sono istituzione prettamente cristiana e cominciarono ad essere eretti subito che il Cristianesimo, libero dalle persecuzioni, potè spiegare le sue naturali tendenze senza danno o restrizione. E così si costruirono luoghi per ricevere i viaggiatori ξενοδοχεῖα, per i poveri πτωχωτροφεῖα, per gli orfani ὀρφανοτροφεῖα, per i trovatelli βρεφοτροφεῖα, per i vecchi γεροντοκομεῖα, e finalmente per gl' infermi νοσοκομεῖα. Qualche volta tutte o diverse di queste istituzioni erano raggruppate nello stesso edificio. Il più grande ospedale di cui abbiamo ricordo nell' antichità fu quello costruito da S. Basilio Magno, che a sua volta fu anche medico, subito dopo che arrivò nel Ponto vicino a Cesarea. Se l' Oriente però fu il primo luogo dove si eressero ospedali, l' Occidente non volle rimanere indietro in quest' opera di pietà. S. Paolino da Nola ci ha lasciato una buona descrizione dell' ospedale costruito da lui stesso, che del resto sembra essere stato più un luogo per il ricovero di vecchi ed indigenti che per malati.

‘ Dispositi trino per lunga sedilia coetu,’
‘ Obstrepueere senes, inopum miserabile vulgus,’
‘ Et socio canae residentes agmine matres.’²

S. Girolamo, in una lettera a Pammachio³ scritta nell' anno 387, parla di un Xenodochio che Pammachio aveva costruito nel Porto romano e di cui S. Girolamo aveva udito parlare. Certo era diretto da Pammachio e dai suoi monaci, per i quali egli aveva costruito un convento nelle vicinanze. S. Girolamo stesso fondò un ospedale a Betlemme e non avendolo potuto portare a compimento per mancanza di fondi, mandò suo fratello Paulimano a raccogliere fondi nel suo paese. Fabiola, l' amica sincera di S. Girolamo, fondò un ospedale a Roma e ciò a detta dello

¹ C. I. G., vol. 4°, pag. 461, N° 9256.

² Poema xx. 114.

³ Epistola 66, al 26, c. 11.

stesso S. Girolamo, che dice: Fabiola essere stata la prima che fondò un ospedale 'prima omnium νοσοκομείον instituit'. È da osservarsi che dice la parola nosocomium e non valetudinarium. Roma stessa ebbe un' antica fama per la cura dei malati e dei poveri come ci ricorda Prudenzio.¹ I suoi ospedali erano frequentemente oggetto della munificenza dei pontefici.

Anastasio² ci dice che Pelagio II (578-590) destinò la sua propria casa per ricovero dei poveri e dei vecchi 'ptochium pauperum et senum'. Il suo successore Gregorio il Grande³ fece passare qualche giorno ad Amanfio nell' infermeria e Giovanni Diacono dice di lui che stabilì sopra i diversi ospedali uomini accurati e coscenziosi, che dovevano riferirgli sull' andamento di questi. Si conoscono molti nomi di ospedali di Roma nell' alto Medio-evo. Il papa Simmaco (489-514) è detto da Aldo aver fondato e restaurato 3 ospedali—Pauperibus habitacula—chiamati coi nomi di S. Pietro, S. Paolo e S. Lorenzo. Stefano III 752-757 è detto da Anastasio aver restaurato 4 xenodochi e fondati due altri che erano accollati alle diaconie regionali di S. Maria e S. Slivestro. Adriano I (772-795) fondò tre diaconie 'foris portam Beati Apostolorum Principis'.

Pietre tombali con iscrizioni latine. Nel 1661 nelle vicinanze di Otricoli un eremita, chiamato Vittore, scavando dietro l' abside della sua chiesetta mezzo diroccata per costruire a questa un muro di sostegno, trovò un sepolcro di travertino il quale conteneva uno scheletro sotto al cui cranio era una piccola pietra di marmo bianco con questa iscrizione:

A✠Ω HICRE
Q. ESCIT ME
DICVS MR X
CV PLVRIB
I · C · Q · E · S · T · R · A · M ·

Il Cancellieri⁴ spiega l' iscrizione così: A · ✠ · Ω. Hic requiescit Medicus Martyr Christi cum pluribus in Christo quiescentibus et sub terra reposita anno millesimo.

Se l' interpretazione data dall' abate Cancellieri all' iscrizione è giusta, possiamo facilmente supporre che nell' anno mille fosse scavato nelle vicinanze d' Otricoli un cimitero cristiano e rinvenuto in questo una lapide di un medico che disgraziatamente è andata perduta. Fu allora costruita la chiesetta e le ossa di questo preteso martire, o martire veramente noi con certezza non possiamo dirlo, furono chiuse dentro l' arca di travertino, che poi l' eremita trovò nel 1661 e vi fu anche nell' interno rinchiusa una piccola iscrizione che ricordasse il ritrovamento.

¹ Peristeph. II, 140 ff.

² Vitae pontif 134 A.

³ Dialogus, iii, 35, pag. 234.

⁴ Memorie di S. Medico martire e cittadino d' Otricoli, Roma, 1812, pag. 20, e segg.

Ad un medico un fratello amatissimo costruisce una tomba e vi appone questa lapide :

LIMENIO MEDICO · FRATRI · CA
RISSIMO Q · VIXIT · ANNOS XXXIII
MENSES · III · DIE

L'iscrizione proviene dal cimitero di Gordiano.¹ È della fine del 4° secolo. Un gruppo singolare d' iscrizioni cristiane è quello che ora illustrerò e che ricorda gli Archiatri. La parola *Ἀρχίατρος* o *Ἀρχίατρος* era usata per designare i medici pubblici, oppure costituiva un titolo onorifico. Colui che per il primo fu designato col titolo di Archiatra fu Andromaco, medico di Nerone e ne abbiamo memoria nell' Onomasticon o Glossario di Ippocrate, scritto da Eroziano, contemporaneo ed amico di Andromaco. Pure Galeno dà ad Andromaco ed a molti altri medici questo titolo. Questa designazione greca non passò nella lingua latina che molto tardi, almeno non si trova, negli autori latini dell' epoca immediatamente posteriore a quella dei due scrittori riferiti, citato alcun medico con questo titolo. Plinio a nessuno dei molti medici, che cita nella sua storia naturale, dà il titolo di Archiatra. Non abbiamo molte iscrizioni funerarie in latino di medici di imperatori, ma nessuna, anche di quelle che vi sono in lingua greca, porta la detta parola. Ne viene per conseguenza che questa è stata per la prima volta data da Eroziano e da Galeno ai medici privati degli imperatori e che da loro viene l'origine di questo titolo. Però esso fu poco impiegato fino all' epoca Costantiniana ed a partire da questa epoca il titolo di Archiatra fu cambiato in quello di ' Archiatus Sacri Palatii '. Le loro attribuzioni furono ingrandite ed i loro privilegi aumentati. Potettero assumere il titolo di Conte di primo e di secondo ordine ed aspirare alle più alte cariche, anche a quella di proconsole e di prefetto del pretorio, e furono assimilati alle più alte cariche dello Stato. In appresso il primo Archiatro del Sacro Palazzo fu investito delle funzioni di giudicare le divergenze sorte tra medici. Circa quest' epoca vennero istituiti Archiatri di tutt' altr' ordine e che corrisponderebbero ai nostri medici condotti municipali, la cui principale funzione era quella d'assicurare il servizio medico a tutti gli abitanti delle due città imperiali.²

Se ne crearono tanti quante erano le regioni della città e cioè 14 a Roma e 7 a Costantinopoli e presero il titolo di Archiatri popolari. Come trattamento fu loro stabilita un ' Annona militaris ', furono esentati dal pagar tasse, tanto essi, che le loro mogli ed i loro figli. Erano però obbligati a curare gratuitamente i cittadini poveri ed ad istruire nella loro arte, i figli dei poveri di condizione libera che volessero darsi all' esercizio della medicina. Dipendevano direttamente dal prefetto della città, che sorvegliava a che fossero sempre al completo. Quando un posto si

¹ Boldetti, loc. cit., pag. 416; Muratori, pag. 962.3; Hensen & G. B. de Rossi, *Corpus Inscriptionum Latinarum*, Berlino, 1882, iscrizione 9588.

² *Codice Teodosiano*, xiii, 3. 8. 9.

rendeva vacante, essi erano convocati dal magistrato, affinchè nominassero un collega ad assoluta maggioranza di voti. Si sceglievano quindi da loro stessi, ma la loro scelta era sottomessa all' approvazione dell' Imperatore, senza la quale non potevano essere convalidati in carica. La loro classifica era per ordine di anzianità. Era loro proibito di accettare promesse o legati dai loro clienti in pericolo. Oltre i 14 Archiatri regionali a Roma due altri medici portavano questo titolo, cioè il medico delle Vestali e quello del portico chiamato Xistus.¹

Ad imitazione delle due grandi capitali dell' Impero anche le città di provincia vollero avere i loro medici salariati, che ugualmente furono chiamati Archiatri. Erano istituiti ed eletti dai Decurioni delle città, ai quali nelle elezioni si aggiungevano anche i principali proprietari di queste e da cui potevano essere anche revocati.

Dette per sommi capi poche cose sugli Archiatri e sugli Archiatri popolari, veniamo all' esame delle nostre iscrizioni. Esse sono 4: di cui tre esistevano nella basilica di S. Paolo ed una nel cortile del Tabulario Capitolino. Quelle provenienti dalla basilica di S. Paolo dovevano in origine esser poste o nel cimitero di Lucina o nella soprastante Basilica Costantiniana. Esse sono:

N° 1.

LOCVS TIMOTHEI · ARCIATRI
ET PAVLINAE

Pubblicata dal Bosio.²

N° 2. E' un frammento di lastra di loculo.³

arCHIATER · Sibi
ET · PINAN

N° 3. Anche questa è un frammento.⁴

ARCHIATER
KAL · SEPTEMB

N° 4. Quella che ora è nel cortile del tabulario capitolino fu ritrovata al Verano, quindi con tutta probabilità proveniva dal cimitero di Ciriaca.

(4) Essa è frammentata e dice:

ARATVS & ARCHIATER & FILIVS HERACLI &
XVI & MENSE & IIII & DIS XVI &
ASILI V · C · CONS · &

Tutte queste iscrizioni appartengono alla fine del IV° o al V° secolo; anzi dell' ultima se ne conosce l' anno esatto giacchè il consolato di Flavio Basilio avvenne nell' anno 463.

¹ Vitruvio, vi. 11, & vi. 27.

² Roma sotterranea, pag. 153; C. I. L., N° 9562.

³ Margarini, N° 288. 3.

⁴ Winghius, Tom. I°, pag. 41; Doni cod. Marucelliano A. 239, pag. 104 & 244; Margarini, N° 84; Nicolai, N° 215, pag. 496.

⁵ Descritta da Giovanni Schmidt, esiste nel C. I. L., N° 9563.

La seguente iscrizione, ora al Museo Cristiano Pio Lateranense, fu trovata nel 1847 nella parte del cimitero di Ciriaca sottostante alla vigna Caracciolo. Essa è di un medico spagnuolo dell' anno 388. Il nome Niceta del padre di questo medico farebbe supporre una provenienza greca.

RAPETIGA · ME
DICVS · CIVIS
HISPANVS · QVI ·
VIXIT · IN · P · ANN · P · M ·
XXV · HOC · PATER · NI
CHITVS · FECIT · D · N · MA
MXIMO · AVG · I I · ⁽¹⁾

Nel cimitero di S. Ermete sulla Via Salaria Vecchia al dire del Maranconi² nella vigna dei Gesuiti del Collegio romano fu trovata l' iscrizione seguente, che ora è a Palermo tra i monumenti portativi da Roma da Astuto Nitense.³

MIGGINI MEDICO
QVI · VIXIT · ANNIS XX
V · MINSIS SI · DIEBVS

Pieno d' interesse è il frammento di lapide che ora riporteremo, appartenente ad un veterinario cristiano del 6° secolo e propriamente dell' anno 514, come risulta dalla data consolare che dice ' cons. senatoris v. c. '. Il console senatore fu Magno Aurelio Cassiodoro segretario di Teodorico re d' Italia.

mul O MEDICVS DEpositus
CONS SENATORis V.C
an NVS XLIII &

L' iscrizione così frammentata esisteva nella basilica di S. Paolo sul pavimento. Fu letta dal Doni e dal Margarini.⁴ Ora è nell' atrio del convento.

Un medico chiamato Pastore nel secolo V°, volle durante la vita costruirsi un sepolcro nella basilica sovrastante al cimitero di S. Valentino.

Essa è in versi e manca solo di un piccolissimo frammento.

HIC PASTOR MEDICUS MONUMEN
TUM IN MARTYRIS AULA. F
ELIX DUM SUPEREST CONDIDIT I
PSE SIBI. PERFECIT CUNCTA EXCOLUIT QUI
AD CARMINA SISTIT. CERNET QUO IACEAT POENA
NEC ULLA MANET. ADDETUR ET TIBI VALENTINI GLODRIA S.
ANCTI. VIVERE POST OBITUM DAT TIBI DIGNA DEUS.

¹ G. B. de Rossi, *Inscriptiones Christianae*, v. I, pag. 165, N° 375; C. I. L., N° 9597.

² *Acta S. Victorini*, pag. 121.

³ *Muratori*, 1825, i; C. I. L., N° 9592.

⁴ Doni, Cod. Maruceliano, A. 293, fol. 106 & 266.

Le due iscrizioni che qui appresso riportiamo non esistono più. Esse sono state pubblicate dal Grutero¹ ed esso ci dice di averle trascritte da un antico codice membranaceo esistente nella Biblioteca Palatina dell' Elettore Federico IV e che per la maggior parte furono copiate nella Basilica Vaticana. La prima è un' iscrizione elegiaca che ricorda un Dionisio medico e levita, il quale alle sue manzoni religiose unì quelle di medico, espletate esclusivamente a pro, dei bisognosi; l' altra è il lamento di una madre, che piange il suo figlio medico mortole subitamente, mentre avea salvato le vite di tanti altri e che era l' unico movente che la tenesse ancora attaccata alla vita. Sembrano ambedue essere de secolo V^o. Esse dicono:

I^a

HIC LEVITA IACET DYONISIUS ARTIS HONESTAE
 FUNCTUS ET OFFICIO QUOD MEDICUS DEDIT
 HUIUS DOGMA MANUS FAMAE DULCEDINE CAPTA
 DISPEXIT PRAETHI SORDIDA LUCRA SEQUI
 SAEPE SALUTIS OPUS PIETATIS MUNERE IUUIT
 DUM REFOVET TENUES DEXTERA LARGA VIROS
 OBTULIT AEGROTIS VENIENTIBUS OMNIA GRATIS
 IMPLEVIT FACTUS QUOD DOCUIT MONITIS
 LAUDIBUS AETHEREIS FAMULATUS MENTE FIDELI
 DESTITIT ILLICITIS ACTIBUS ESSE REUS
 AMISSIS OPIBUS ROBUR NON PERDITIT ULLUM
 QUO PATIENS PRAEDAE TEMPORE DIVES ERAT
 ARS VENERANDA FIDEM FIDEI DECUS EXTULIT ARTEM
 HAEC STUDII TITULOS ALTERA MENTIS HABET
 CIVIBUS AC SOCIIS QUALIS FUIT INDE PROBATUR
 QUEM POTUIT VICTOR HOSTIS AMARE SUUS
 POSTQUAM ROMANA CAPTUS DISCESSIT AB URBE
 MOX TIBI DÑS SUBDIDIT ARTE GETAS
 OS CERVIS MANIBUS VITTAM COMMITTERE FECIT
 QUORUM MORTIFEROS PERTULIT ANTE METUS

2^a

HAEC QUAECUMQUE LEGIS DEVOTO PECTORE MATER
 DA LACRYMAS ET ME SIC PEPERISSE DOLE
 HIC IACET EXTINTUS CRUDELI FUNERE NATUS
 ULTIMA VIVENDI QUO MIHI CAUSA FUIT
 MAXIMA PRAESTABAT MISERAE SOLACIA MATRI
 CONSILIO FRATRES ET PIETATE COLENS
 PLURIMA RESTITUIT CURANDO CORPORA VITAE
 QUEM MIHI TAM SUBITO MORS PROPERATA FUIT

¹ *Il cimitero e la basilica di S. Valentino*, Roma Desclée, 1890, pag. 96.

² *Inscriptiones antiquae*, vol. 2^o, pag. 1173 & 1176.

E con queste iscrizioni finiscono tutte le lapidi di medici cristiani che esistono anteriori al secolo 8° e queste, unite alla pittura ed alla pietra tombale anepigrafica, formano ben ventuno documenti di altissima importanza per la storia della medicina ; e cioè : una pittura cimiteriale, la pietra tombale anepigrafica, sette iscrizioni greche e dodici latine. Di tutte queste iscrizioni solamente quattro sono datate e benchè alcune di queste siano state trovate non in Roma, pure la maggior parte provengono dall' URBS CAPUT MUNDI e quasi tutte dai suoi cimiteri cristiani sotterranei o da quelli a questi sovrastanti.

[Friday Afternoon, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

NOTES SUR QUELQUES DROGUES MENTIONNÉES
DANS LE 'DE NOMINIBUS UTENSILIIUM'
D'ALEXANDRE NECKAM

PAR M. LE DR. P. DORVEAUX, DE PARIS

ALEXANDRE NECKAM, né en 1157 à Saint-Albans (Angleterre), fut, vers 1180, professeur à la fameuse école du Petit-Pont, à Paris. Revenu dans sa patrie, il y dirigea l'école de Dunstable, entra dans l'ordre des Augustins et devint, en 1213, abbé de Cirencester. Il mourut à Kempsey en 1217. Il a composé un grand nombre d'ouvrages, entre autres un traité intitulé *De nominibus utensilium*, qui est une de ces copieuses nomenclatures en honneur dans les écoles au moyen âge.

Ce traité, dont il existe de nombreux manuscrits, a été publié à deux reprises différentes : la première fois, en 1857, par Thomas Wright¹ ; la seconde, en 1866, par Scheler². Écrit dans un latin barbare, il a été trop souvent rendu incompréhensible par l'ignorance et l'incurie des scribes qui l'ont copié.

Un des passages les plus obscurs est le suivant, qui contient l'énumération de quelques drogues (je le reproduis d'après Scheler, avec les variantes de Wright) : *Specularia autem competenter sint disposita in domo, eoas (W., orientales) partes respicientia, ubi succina (W., succina), sive (W., vel) pixides tortiles sub divo ponantur, in quibus storacis calamita, non (W., non autem) storacis sigia nec sigie colimbrum (W., corimbrum) contineatur, sed serapinum, amomatroum (W., amomatum), opanatum (W., opanaclum), delium (W., abdellum), euphorbium (W., euforbium), sarcotalla, masticum, populeon (W., populeon), oleum laurinum, offatilion (W., vinfacileon), sambucelion, castorium (W., castrorium), anatileon, et epitimata (W., epithimata).³*

Le nombre et la variété des expressions pharmaceutiques contenues

¹ Wright (Thomas), *A Volume of Vocabularies*, Liverpool, 1857, p. 109.

² Scheler, 'Trois traités de lexicographie latine du XII^e et du XIII^e siècle. II. Alex. Neckam, 'De nominibus utensilium,' *Jahrbuch für romanische und englische Literatur*, t. vii, pp. 58, 155, Leipzig, 1866.

³ Scheler, loc. cit., p. 157.

dans ce passage ont étonné les savants qui ont étudié le *De nominibus utensilium*. Tous se sont demandé où Neckam avait puisé ces termes techniques, généralement ignorés des pédagogues. Mais si l'on se rappelle que Neckam fut, pendant plusieurs années, professeur à l'école du Petit-Pont et que la région du Petit-Pont était de son temps le quartier des apothicaires,¹ alors on s'explique que dans ses relations quotidiennes avec ses voisins, dont il instruisait les enfants, il ait appris le vocabulaire pharmaceutique.

Le passage que je viens de citer me paraît devoir être rétabli de la façon suivante :

Specularia autem competenter sint disposita in domo, eoas partes respicientia, ubi scrinia sive pyxides tortiles sub divo ponantur, in quibus storax calamita, non sigia nec corimbrum, contineatur, seraphinum, amoniacum, opopanacum, bdellium, euphorbium, sarcocolla, masticum, populeon, oleum laurinum, omfacileon, sambuceleon, castoreum, anetileon, et epithemata.

Il peut être traduit ainsi : ' Dans la maison, les fenêtres devront être disposées convenablement et regarder du côté de l'orient. On y exposera en plein air les récipients et les boîtes faites au tour, dans lesquels seront contenus : le styrax calamite, et non le styrax liquide ou le storax rouge, le sagapénium, la gomme ammoniacque, l'opopanax, le bdellium, l'euphorbe, la sarcocolle, le mastic, l'onguent populéum, l'huile de baies de laurier, l'huile d'olives non mûres, l'huile de sureau, le castoréum, l'huile d'aneth et les épithèmes.'

Le mot *succina* (*suctina* de Wright) ne pouvant être que le pluriel inusité de *succinum* (succin, ambre jaune), est certainement un mot mal lu, car il est donné comme un synonyme de *pyxides* : cette synonymie est attestée dans le texte de Wright par une ancienne glose, qui traduit *suctina* par 'boistes' et *pyxides* par 'boystes'. Or, les synonymes de *pyxides* ayant une certaine analogie avec *succina* ou *suctina* ne sont pas très nombreux. J'avais d'abord songé à *scatulae* (pluriel de *scatula*), terme de basse latinité qui figure dans le *Lexicon medicum graeco-latinum* de Castelli, lorsque le *Glossarium latino-germanicum* de Diefenbach m'a suggéré *scrinia* (il donne *scrinium* comme synonyme de *scatula*) : paléographiquement *scrinia* peut être lu *sucina* (*sucinum* est la forme classique de *succinum*).

Les récipients et les boîtes de l'apothicairerie mentionnés par Neckam doivent contenir ou ne pas contenir les drogues suivantes :

1° STORAX 2° CALAMITA. C'est le *στυράξ καλαμίτης* des médecins grecs, ainsi nommé parce qu'il leur était apporté de Pamphylie dans des tiges

¹ Cf. Jean de Jandun, 'Tractatus de laudibus Parisius,' *Histoire générale de Paris : Paris et ses historiens aux XIV^e et XV^e siècles*, par Le Roux de Lincy et Tisserand, Paris, 1867, p. 44.

² *Storax*, et non *storacis*. Le génitif est très souvent mis pour le nominatif dans les textes du moyen âge, parce que, dans les formules des préparations tant officinales que magistrales, les noms des drogues étaient toujours au génitif, cas que les ignorants prenaient pour le nominatif.

de roseaux (κάλαμος). Il est appelé *storax*, *storax vrai*, *storax solide*, *styrax calamite*, *baume storax*, etc., dans les anciens traités de matière médicale. Flückiger et Hanbury¹ le définissent : ' une résine solide assez semblable au benjoin, à odeur balsamique forte, tenue en grande estime depuis l'époque de Dioscoride et de Pline jusqu'à la fin du XVIII^e siècle. On la retirait, disent-ils, de la tige du *Styrax officinale* L., famille des Styracées, originaire de la Grèce, de l'Asie Mineure et de la Syrie.' Le styrax calamite est aujourd'hui de toute rareté.

2^o SIGIA. Cette drogue dont Neckam ne veut pas, est le styrax liquide, que Flückiger et Hanbury² décrivent de la façon suivante : ' résine molle, visqueuse, ayant d'ordinaire la consistance du miel, plus lourde que l'eau, opaque et colorée en brun grisâtre.' On l'extrait du *Liquidambar orientalis* Miller, dans les forêts du sud-ouest de l'Asie Mineure. *Sigia*, dit Simon Januensis³, *id est storax liquida quae et stactis graece dicitur* (les anciens ont identifié le στακτὴ de Dioscoride avec le styrax liquide). C'est la transcription du grec ζυγία, qui est le nom de trois arbres au feuillage analogue : l'érable commun (*Acer campestre* L.), le platane d'Orient (*Platanus orientalis* L.) et le *Liquidambar orientalis*. Le styrax liquide a donc reçu au moyen âge le nom de l'arbre qui le produit.

3^o CORIMBRUM. Cette drogue, que Neckam exclut également, est le storax rouge, autrement dit, le résidu de la fabrication du styrax liquide obtenu par l'expression de l'écorce du *Liquidambar orientalis*. Elle figure dans plusieurs formules de l'*Antidotarium Nicolai* : dans la *confectio aliptae muscatae* et dans le *diairis*, sous le nom de *storax rubea* ; dans le *paulinum antidotum*, sous celui de *cozumbrum*. On la trouve dans le commerce sous forme de ' lanières étroites, minces, rougeâtres, pressées les unes contre les autres, sèches, mais conservant encore une forte odeur balsamique '.⁴

Le mot *corimbrum* est écrit : *corzumbrum* et *cozumbrum* dans l'édition princeps de l'*Antidotarium Nicolai* (Venise, 1471, fol. 26 r^o) ; *corimbrum* dans le *Dispensarium magistri Nicolai Prepositi ad aromatarios* (Lyon, 1505, fol. 70 r^o) ; *corimbrium* et *corimbrum* dans *Mesuae Opera* (Venise, 1568, 2^e partie, fol. 219 r^o) ; *cozumbrum* dans le dictionnaire de Simon Januensis⁵ ; *cozubrum*, *cosubrum* et *coçubrum* dans le dictionnaire de Matthaeus Silvaticus⁶ ; *cozubrum* et *consubrum* dans l'*Hortus sanitatis* traduit de latin en françois (1^e partie, fol. 240 v^o) ; *corimbrum*, *cozim-*

¹ Flückiger et Hanbury, *Histoire des drogues d'origine végétale*, trad. de l'anglais par J. L. de Lanessan, t. i, p. 488, Paris, 1878.

² Flückiger et Hanbury, loc. cit., t. i, p. 484.

³ Simon Januensis, *Clavis sanationis*, Venise, 1486, v^o *Sigia*. Ce livre est un dictionnaire de médecine, dans lequel la matière médicale abonde.

⁴ Guibourt, *Histoire naturelle des drogues simples*, 6^e édition par G. Planchon, t. ii, p. 308, Paris, 1869.

⁵ Simon Januensis, loc. cit., v^o *Cozumbrum*.

⁶ Matthaeus Silvaticus, *Opus pandectarum medicinae*, v^o *Conficta* et v^o *Melachac*.

brum et *cozumbrum* dans l'*Alphita* publié par Mowat (pp. 44, 185 et 233, Oxford, 1887); *cocumber*, *cozumber* et *cotzumber* dans le *Glossarium mediae et infimae latinitatis* de Du Cange; etc. Il serait d'origine à la fois romaine et rituelle, d'après les citations suivantes de Sérapion, faites par Matthaeus Silvaticus¹; *Substantia vero storacis siccae quae non habet oleum*, dit-il, *administratur in suffumigationibus, et istam Romani vocant confictam vel cozubrum*; et quelques lignes plus bas: *Substantia vero storacis siccae quae non habet oleum utuntur christiani*² *in eorum ecclesiis et suffumigationibus, et vocant eam confictam vel cozubrum*. Le storax sec qui ne contient plus d'huile, c'est-à-dire de styrax liquide, est le storax rouge. Ce produit était employé principalement comme parfum liturgique, d'où les noms de *thymiam* (θυμίαμα, parfum, encens), *cortex thymiamatis*, *thus Judaeorum*, etc., qu'il a reçus.

4° SERAPINUM. Sagapénium, gomme-résine produite par une Ombellifère de Perse (*Ferula persica* Willd. ou *Ferula Szowitziana* DC.). Dioscoride l'appelle σαγάπηνον, et Pline, *sagapenon* et *sacopenium*.

5° AMONIAIUM (ἄμμωνιακόν de Dioscoride). Gomme-résine ammoniacque. La gomme ammoniacque est tirée d'une Ombellifère de Perse, le *Dorema Ammoniacum* Don.

6° OPOFANACUM (ὀποφάναξ de Dioscoride). Gomme-résine produite par une Ombellifère de Perse, l'*Opopanax Chironium* Koch.

7° BDELLIUM (βδέλλον de Dioscoride). Gomme-résine dont les traités de matière médicale décrivent 'trois sortes, qui paraissent être les mêmes que celles de Dioscoride', dit Guibourt³; ce sont: le bdellium d'Afrique, le bdellium de l'Inde et le bdellium opaque. Tous trois sont tirés de plantes de la famille des Burséracées, appartenant au genre *Commiphora* Jacq.

8° EUPHORBIIUM (εὐφόρβιον de Dioscoride). Gomme-résine d'euphorbe. Cette substance est produite par une euphorbe du Maroc, l'*Euphorbia resinifera* Berg.

9° SARCOCOLLA (σαρκοκόλλα de Dioscoride). Sarcocolle, substance résineuse qui découle d'un astragale de Perse, l'*Astragalus Sarcocolla* Dymock.

¹ Matthaeus Silvaticus, dans son article *Melachac*, a publié un texte latin de Sérapion qui diffère considérablement de celui qui se trouve dans le recueil intitulé: *Practica Jo. Serapionis dicta Breviarium* (Venise, 1497, fol. 106 v°). Dans celui-ci, on ne rencontre ni le mot *conficta*, ni le mot *cozubrum*.

² D'après une citation faite par J. J. de Manliis de Bosco (*Luminare majus*, Venise, 1496, fol. 62 r°, formule de l'*unguentum alabastrum*), Leonardus de Preda palea, plus connu sous le nom de Bertapaglia, dit que c'était les Juifs qui se servaient du storax rouge comme encens dans leurs synagogues. C'est aussi l'opinion de d'Herbelot (*Bibliothèque orientale*, article 'Loban', Paris, 1697, p. 515, col. 2), qui s'exprime ainsi: 'Les Juifs desquels sont venues les suffumigations dont on se sert dans les temples, n'employaient pas cependant l'encens, mais le storax (*sic*) appelé par les Grecs *styrax*, *narcaphthon* et *thymiam*, qui croît dans la Judée et dans la Phénicie, au lieu que le véritable arbre de l'encens ne croît que dans l'Arabie.'

³ Guibourt, loc. cit., t. iii, p. 513.

10° MASTICUM (μαστίχη de Dioscoride). Mastic, résine tirée du tronc et des branches principales du lentisque (*Pistacia Lentiscus* L.).

11° POPULEON. Onguent ainsi nommé à cause des bourgeons de peuplier (*Populus nigra* L.) qui en sont la base. Sa formule qui figure dans l'*Antidotarium Nicolai*, se trouve encore dans le *Codex medicamentarius Gallicus* de 1908, sous le titre : 'Pommade de bourgeons de peuplier.'

12° OLEUM LAURINUM (δαφνέλαιον de Dioscoride). Huile de laurier des anciennes pharmacopées. On la retirait des baies du *Laurus nobilis* L.

13° OMFACILEON. C'est l'ὀμφάκινον ἔλαιον des médecins grecs,¹ que Jean de Gorris² définit : *acerbum oleum, hoc est, ex olivis acerbis expressum*, c'est-à-dire, l'huile extraite d'olives non mûres. Le mot *omfacileon* (*offatilon* de Scheler ; *vinfacileon* de Wright qu'il faut lire : *umfacileon*) se trouve dans les dictionnaires de Simon Januensis et de Matthaeus Silvaticus, qui le donnent comme synonyme d'*oleum omfacinum*. On y trouve aussi : *oleum onfacinum est quod ex olivis immaturis fit*.

14° SAMBUCELEON. Ce mot, qui se trouve dans le *De gradibus simplicium* de Constantinus Africanus,³ a été défini par Matthaeus Silvaticus : *Oleum sambuceleon, id est, de sambuco*. C'est l'huile de sureau, dont Mésué⁴ a indiqué la préparation et les vertus.

15° CASTOREUM. Cette drogue, mentionnée par Dioscoride et par Pline, figure encore dans le *Codex* de 1908 (p. 130), qui la définit : 'produit sécrété par des glandes annexes de l'appareil génital mâle ou femelle du *Castor Fiber* L.'

16° ANETILEON (ἀνθήλαιον de Galien ; *anethleon* de Constantinus Africanus). Huile d'aneth des anciennes pharmacopées. Mésué⁵ en a indiqué la préparation et les vertus.

17° EPITIMATA (pour *epithemata*, pluriel de *epithema*, ἐπίθεμα). Les anciens appelaient *épithèmes* les topiques mous ou aqueux (cataplasmes, fomentations, etc.) qui s'appliquaient sur la région du cœur, de l'estomac ou de l'abdomen. Les épithèmes étaient généralement des préparations magistrales : cependant, il y en avait un certain nombre d'officinales, que Simon Januensis a mentionnées dans son *Clavis sanationis* (v° *Epythyma*).

De ces drogues, les dix premières pouvaient parfaitement être logées dans des boîtes de bois tourné (*pyxides tortiles*) ; quant aux autres, elles exigeaient ou des fioles de verre, ou des vases de terre vernissée, ou des récipients d'étain : ce serait là les *scrinia*⁶ de Neckam.

¹ Galenus, *Opera omnia*, ed. Kühn, t. xi, p. 868, Leipzig, 1826. Dioscorides, *De materia medica libri V*, ed. Sprengel, t. i, p. 43, Leipzig, 1829.

² Gorraeus (Jo.), *Definitionum medicarum libri XXIV*, Paris, 1564, fol. 244 v°.

³ Constantinus Africanus, *Opera*, Bâle, 1536, p. 361.

⁴ Mesuae *Opera*, Venise, 1568, 1^{re} partie, fol. 195 v°.

⁵ Mesuae *Opera*, 1^{re} partie, fol. 195 r°.

⁶ Mon collègue et ami, M. Victor Mortet, est d'avis qu'il faut lire non pas *scrinia*, mais *saccula*, au lieu de *succina* ou *suctina*, parce que Du Cange (*Glossarium mediae et infimae latinitatis*, v° *Saccus* 2) dit : *Sacculum vini, (id est) vas vinarium*.



[Friday Afternoon, August 8]



SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

**SOME PATHOLOGICAL AND OTHER CONDITIONS
OBSERVED AMONG THE HUMAN REMAINS
FROM A PREHISTORIC ETHIOPIAN CEMETERY
IN THE SOUTHERN SUDAN, AFRICA**

BY M. B. RAY, M.D. EDIN., AND L. H. DUDLEY BUXTON, B.A. OXON.

MATERIALS dealt with in this paper were excavated in a prehistoric Ethiopian cemetery by Mr. Henry S. Wellcome, and he has kindly permitted us to publish this brief paper in advance of his full report,

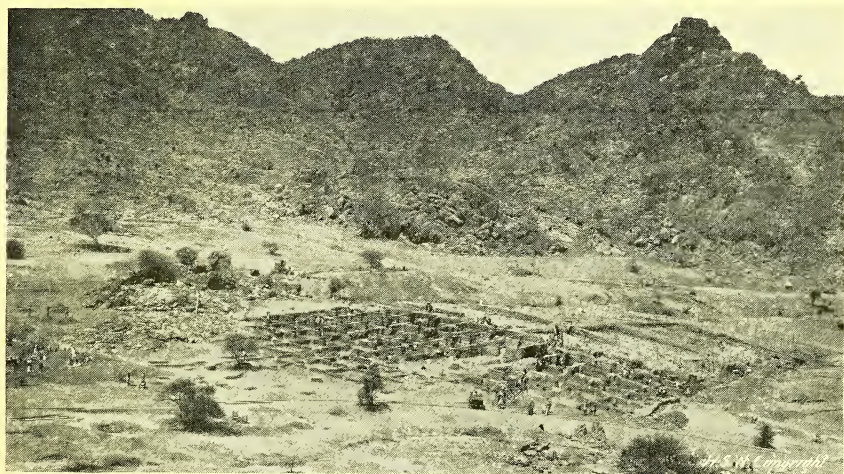


FIG. 1. Site of Mr. Wellcome's Archæological Excavations, Gebel Moya.

which will appear later on. The cemetery lies in the southern part of the Gezira, *i.e.* the tongue of land between the White and Blue Niles (Fig. 1). It is in North latitude $13^{\circ} 30'$, roughly speaking about level with Aden, and is estimated to be about 35 kilometres west of the Blue Nile, 75 kilometres east of the White, and about 320 kilometres south of Khartoum. No completed survey of this region has yet been made.

Gebel Moya itself is a range of granite hills rising to about 250 metres above the plain; the cemetery is situated in a sort of basin up among the hills. In the very brief rainy season this hollow receives from the surrounding extensive watersheds quantities of water, which rushes in torrents down a precipitous rocky gorge to the south-west of the cemetery. All around the Gebel the plain stretches, as far as eye can reach, a thick tangle of often impenetrable acacia thorn, broken only by open plains with many isolated clusters of granite rock looking like islands in the sea, and occasional patches of cultivation. At the latter end of the dry season, that is towards the end of March, when all the reservoirs are dry and the wells very low, migrations to the Niles take place, although at Gebel Moya—as the name water-hill suggests—there are some wells yielding a meagre supply of brackish water, and indications are not wanting that at one time there was more water than at present.

The water conditions are of great importance when we come to consider the preservation of the bones and also the fact that we have such a large populated centre and a cemetery in one place.

Having thus explained the source of the water-supply for the former inhabitants of Gebel Moya, let us consider their food, as this matter is very important for our present purpose. Such evidence as we have so far discovered leads us to believe that on the whole, in matter of diet, little change has taken place up to the present day. The staple food of the modern inhabitants is dhurra cakes and milk; meat is eaten, but as far as could be judged, very sparingly. The dhurra, which is the most important article in the diet of the agricultural Nilotic peoples, is a cereal related to a common English weed, *Holcus lanatus*, the Yorkshire fog-grass. Dhurra is solely a rain crop at Gebel Moya, and the rains only last about six or eight weeks. It grows quickly, often over 6 feet high, the heads often being very large. The grain is round and about the size of a small dried pea.

Now our archaeological evidence shows us that in former times a cereal of some sort, whether dhurra or sesame or some other grain, was extensively used, for some of the commonest objects discovered are mullers and grindstones not dissimilar to those used at the present day in grinding the grain after it has been pounded in a mortar. Secondly, pits have been discovered in the cemetery site which were exactly similar to the pits which the present people use as granaries for storing the dhurra.

Next we have abundant osteological evidence that the ancient people possessed cattle, and indications that these latter played a very important part in their daily life. On the other hand, burnt bones, the invariable accompaniment of flesh-eating man, were few and far between, whereas at a different site, and probably of a different date, in the same range of hills, one of us examined the bones and found a very large proportion had been in the fire.

Turning now to a third point, without the consideration of which a discussion of the pathological conditions of any people would be incomplete,

let us try briefly to reconstruct the mode of life of the early inhabitants of Gebel Moya.

Numerous stone implements have been discovered, a large number of which are probably contemporary with the graves. These are mostly similar to those that would in Europe be called neolithic, and many exhibit considerable skill in the working and polishing of granite.

An extensive range of pottery, from very primitive to fine fabrics of beautiful types, has also been abundantly discovered. The people possessed ivory and ostrich eggs and made decorative lip-studs out of pottery and stone, sometimes wearing as many as seven in one lip. Special stress must be laid on this latter custom, as the wearing of lip-studs has considerable effect on the teeth.

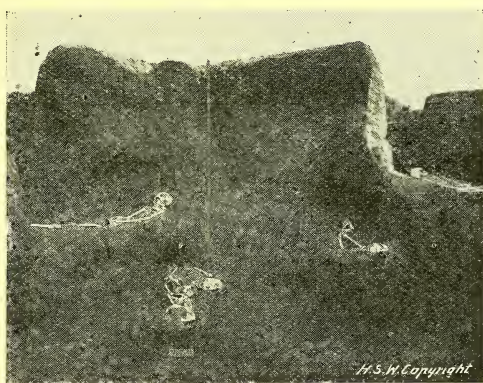


FIG. 2.

So much then for general conditions. There are two special conditions, *i.e.* conditions which apply in particular to this cemetery, which must now be dealt with. First, in regard to date. Until the excavations are completed and the results fully studied, it is difficult at present to come to any definite conclusion on this point, but it is at least certain, from clearly datable evidence of objects found near the surface of the upper strata, that the latest of the burials can be dated about 700 B.C., and, from the fact that bodies are found in various lower strata to considerable depths, we may presume many of the bodies are of very remote antiquity (Fig. 2). Secondly, a noticeable feature of the bodies found is the large predominance of the females over the males; we have, however, discovered a sufficiently large number of males as to preclude the idea of a female cemetery. The explanation of this curious fact is uncertain; possibly wars may have been responsible for the destruction of the males away from home.

The pathology of the teeth of our specimens is of considerable interest. First, in regard to periodontal disease. We are very much indebted to Mr. F. J. Collier for his suggestions and help. Following Mr. Collier's

advice, we have classified the specimens under two headings: first, those in which the cause of the disease lies chiefly in the mechanical influence of food packing, especially in the first molar region. The alveolus in some cases has been so much absorbed that the teeth had fallen completely out of their sockets. In many of our specimens, the above condition was also accompanied by subcervical caries, which is well shown in the radiograph.

In direct contrast to these conditions, in a few cases we found that the subject was clearly suffering from general periodontal disease, accompanied by considerable rarefying osteitis. As might be expected from the comparative density of the two jaws, this condition usually first appears in the maxilla; indeed we very much doubt if any of the mandibles from Gebel Moya show evidence of general periodontal disease.

There are a number of specimens which show abscess cavities at the roots of the teeth, and in some cases the trouble has found an outlet not on the buccal surface of the maxilla, but in the antrum, or, in one example, the anterior part of the floor of the nasal aperture.

Crowding in the incisor region is not an uncommon feature; the chances of this are enhanced by the very large size of the central incisors—a racial characteristic. The crowding is sometimes masked by the extraction of the central incisors.

Where the extraction has not been performed, and in many cases where, owing to crowding, the operation has had little effect on the mouth, the front of the teeth present a very worn surface from the continual rubbing of the plug on the teeth.

Turning to the molar region, we find that in spite of the size of the jaws and of the teeth, the third molar suffers similar degeneration, and the case of an impacted molar is found as in modern conditions.

In comparing the general condition of the teeth in Gebel Moya specimens with those of modern Europeans, it is interesting to note that 'food packing' is much commoner in the Ethiopians than in Europeans; the latter, however, are much more subject to caries. The ancient inhabitants of Gebel Moya ground down the crowns of their teeth to a greater degree than any European in old age, though perhaps on the whole the ancient people under consideration kept their teeth better than we do; still, from what evidence we have, we may believe that they reached old age 'sans teeth, sans everything.' On the whole, however, they followed the Greek proverb, 'Those whom the gods love, die young.'

We have only observed one case of supernumerary teeth, that of a supernumerary premolar, and in one case the second premolar had three roots; this latter abnormality may of course have occurred more frequently without being observed.

We searched carefully for signs of osteo-arthritis, as there is evidence of the prevalence of this disease in Egypt at an early period, but we were only able to discover it in a very few cases; in one a fifth metatarsal, and in another one of the phalanges of the hallux, showed a characteristic

nodular appearance. In the case of the former example other bones of the same foot seemed to be affected.

One vertebra calls for special mention, as it is a particularly interesting case of arrested growth. The body of the vertebra (an eleventh dorsal) is almost crescent-shape owing to the fact that premature ossification of the growth centres took place. The skeleton was that of a young adult male, remarkable principally for its great size and for the muscular development of the arms.

We had expected to find considerable evidence of traumata on the bones, but as a fact we have few examples. Two depressed fractures are exhibited; they seem to be possibly due to a blow from a blunt instrument.

We found a certain number of fractured limbs. A very common form of injury among the ancient Egyptians, as Professor Elliot Smith and others have pointed out, is a fractured forearm. This was specially common among the women and is probably due to the effort to ward off the blow of a stick. The same form of injury due to the same cause is not uncommon among the modern Sudanese. However, it seemed unusual among the bodies we excavated. Fractured humeri occurred, and an example of a Pott's fracture calls for special mention as illustrating surgical skill of the ancient peoples, who probably got as good results as were attained in modern times until fractured ends were secured in apposition by mechanical means.

Calculi, vesical and biliary, were of common occurrence in the abdomina of the bodies we examined, and in some cases we were able to locate their exact position in the grave. A particularly fine specimen is illustrated (Fig. 3). This is very good because it shows the stones after they have escaped from the ruptured gall-bladder.

One skull was found with a large osteoma on the parietal bone. The tumour was hemispherical in shape, about two centimetres in diameter, and one centimetre high. We palpated the interior of the skull to discover if any pressure had been exerted on the brain, but the inner tablet showed no signs of abnormality.

Some of the specimens illustrating the various cases referred to in this paper are exhibited at the Historical Medical Museum.

Only a small number of the more than a thousand human remains discovered have yet been thoroughly dealt with. All, so far as their



FIG. 3.

condition will permit, are being carefully studied, and fully illustrated reports will be published as soon as practicable after the excavations are completed.

The burials thus far have mainly been on the border of the site, and where they have been most disturbed and exposed to damage. Mr. Wellcome is continuing his excavations, and when he reaches the centre of the site, it is anticipated that he will find still more interesting material in better condition, and which will throw some further light on pathological conditions as well as on the prehistoric races of Ethiopia, of which very little has hitherto been known.

Owing to the fact that our specimens, from being subjected alternately to torrential rains and extreme drought, were in a very brittle condition,

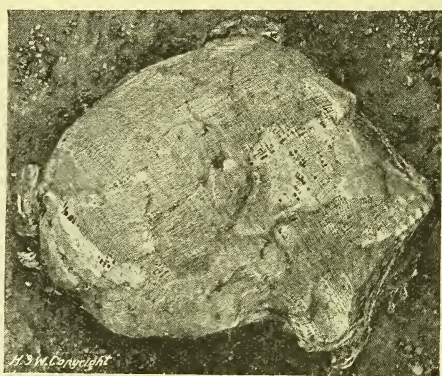


FIG. 4.

it was necessary to take special precautions for their preservation. As the result of a series of experiments, a special method was devised as follows: The skull or other bone to be treated was, while still *in situ*, cleansed as far as possible. It was then carefully scrubbed over with a paint-brush dipped in hot water. Then a piece of gauze roughly cut to the right shape was dipped in a strong solution of ordinary gelatine and spread over the surface of the bone (Fig. 4). In this way a covering was made which moulded itself on to the upper side of the bone. The specimen was allowed to dry—about half an hour. We found that if exposed too long to the tropical sun, the gauze cracked and peeled off. After raising the bone the under side was treated in the same way. We found that many skulls which would otherwise have fallen to pieces were by this method kept intact. The bones so treated stood the journey to England well, and the gauze is easily removed with warm water and a small brush.

[Friday Afternoon, August 8]

SECTION XXIII HISTORY OF MEDICINE

INDEPENDENT PAPER

THE LIFE AND WORKS OF RHAZES (ABŪ BAKR MUḤAMMAD BIN ZAKARĪYA AR-RĀZĪ)

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Sources of the life of Rhazes. The most important source for information as to the subject of this paper is the biographical sketch written in the thirteenth century of our era by Muwaffaqu-d-dīn Abu'l 'Abbās Aḥmad bin al Qāsim bin Khalīfat bin Yūnas al Khazrajī, commonly known as Ibn Abī 'Uṣaibī'a.¹ The work in which this life of Rhazes occurs is called '*Uyūnu-l-Anbā fi ṭabaqāti-l-aṭibbā*' ('Sources of information concerning Classes of Physicians'), and was compiled by the author in the year 1245-6 (A.H. 643) at Damascus, of which city Ibn Abī 'Uṣaibī'a was a native, having been born there in A.D. 1203, and dying there in A.D. 1269. He was the son of an oculist, and was himself a physician and for a time was director of a hospital founded by Saladin at Cairo.² The notice of Rhazes is contained in the eleventh chapter of this work, which, as its name implies, comprises notices of several other eminent physicians, among them Rabnu-t-tabarī, who was, as will be seen, the master of Rhazes.

The edition of this work, from which the following epitome is taken, is that published at Cairo in A.D. 1882 by A. Müller, in the preface to which it is stated that the 'Uyūn was written at the expense of Amīnu-d-daulah bin Ghazāl, vizīr to Ibnu-l-malik al-'Ādil.

A further source of information is the *Wafayātu-l-'Aiyān* ('Obituaries of Men of Note') of Ibn Khallikān (1211-82), which was written between the years A.D. 1256 and 1274, and is therefore parallel in time with Ibn Abī 'Uṣaibī'a's work above mentioned.

From these two works all the notices of Rhazes found in later times have been compiled, and it is upon them also that the following account of Rhazes' life will be based.

Abū Bakr Muḥammad bin Zakarīyā ar-Rāzī was the full name of the

¹ Died A. D. 1269.

² Browne, L. H. P., ii. 477.

famous physician more familiarly known to us as Rhazes. The term ar-Rāzī, of which Rhāzes is the representative, denotes that he was born at Rai or Rayy (Rhages), the principal city of the north-east part of the Jibāl province of Persia. The exact date of his birth is not known, but he must have been born about the middle of the ninth century of our era. He died in the year A.D. 923-4 (A.H. 311) either at Baghdād or Rayy, it is not certainly known which.

Devoted from early life to intellectual pursuits, he studied philosophy under Al-Balkhī,¹ and spent some years in writing poetry, chiefly, as appears from his recorded writings, in metaphysical subjects and logic; while his attention was also turned during the same period to music, on which art he composed a work, *Fī jumālī-l-Mūsīqī*, an encyclopædia of music, and was also a skilled player on the lute as well as a singer. It is recorded by Ibn Khallikān that the reason of his abandoning the practice of these accomplishments was his feeling that music 'proceeding', as he said, 'from between moustaches and a beard' had no charms to recommend it.

At the age of thirty or upwards he left his native place and travelled to Baghdād, and it was while there that he became attracted towards the study of the medical art. His first impulse in this direction is said by Ibn Abī 'Uṣaibi'a to have arisen on the occasion of a visit which he paid to the 'Aẓudī' hospital in Baghdād, where he heard from one of the officers of that hospital of a wonderful cure of an excessively painful inflammatory swelling of the forearm by the application of a certain plant, which had in consequence become so famous as to have earned the name of *Ḥaiyyu-l-'Ālam* ('The Vivifier of the World'), of the circumstances of the discovery of which Ibn Abī 'Uṣaibi'a gives an account. Rhazes' interest being keenly aroused by this incident, he paid a further visit to the hospital, where, according to our author, 'he saw a boy who had been born with two faces on a single head.' Receiving an explanation of this strange phenomenon, his curiosity was still further stimulated, and he was led to make several inquiries into the various points which came under his notice, till in the end he decided to devote his life to the study of medical science. Ibn Abī 'Uṣaibi'a quotes a statement which had been current to the effect that Rhazes was one of those who were consulted by 'Aẓudū-d-daula about the construction of the hospital on an appropriate site, and that he was selected finally, from among more than a hundred competitors, for the post of chief physician-in-charge of the 'Aẓudī hospital. This statement, however, involves an anachronism, inasmuch as Rhazes died in the year A.D. 923, whereas 'Aẓudū-d-daula was not born till the year A.D. 936, and did not succeed to the government of Fārs and 'Irāq till A.D. 976, so that the hospital which went by his name in Baghdād was not in existence during the lifetime of Rhazes.

¹ Aḥmad bin Sahl al-Balkhī Abū Zaid, *ob.* A.D. 934 (A.H. 322), the famous philosopher. See Yāqūt's *Dictionary of Learned Men* (D. S. Margoliouth), vol. i. 141.

Ibn Abī 'Uṣaibī'a says, with reference to this, that Rhazes' visit to the hospital was prior to its 'restoration' by 'Aẓudu-d-daula, which must have been the case. He also states that Rhazes composed a work 'on the description of the hospital and of all that he saw of the condition and surroundings of the sick who were undergoing treatment in it'. This is probably the work included in his list under the title *Ṣifātu-l-bīmārīstān* ('Description of the hospital'), [No. 222].

That the hospital built under the orders of 'Aẓudu-d-daula the Buyide was called 'The New Hospital' is evident from the statement of 'Ubaidu'llah bin Jibra'il, quoted by Ibn Abī 'Uṣaibī'a, to the effect that when 'Aẓudu-d-daula built the 'new hospital' (البیمارستان الجديد) beside the bridge on the west side of Baghdād, 'he collected for its service twenty-four physicians,' some of whom he specifies by name, adding that his own father, Jibra'il, accompanied 'Aẓudu-d-daula from Shīrāz, and was appointed one of the staff of the hospital.

It is therefore certain that the hospital in Baghdād which Rhazes originally visited was an earlier hospital than that erected by 'Aẓudu-d-daula, and that the name 'Aẓudī' has attached to it in Ibn Abī 'Uṣaibī'a's account simply from later association.

We learn further from Ibn Juljul (Abū Dā'ūd Sulaimān Ibn Ḥassān), who was physician to Hishām al-Muwaḥḥid b'illāh, the Umayyide Caliph of Spain,¹ and wrote a 'History of Physicians', that Rhazes was administrator (*mutawallī*) of the hospital at Rayy (Rhages) for some time before he took over the office of physician and superintendent of the 'Aẓudī' hospital during the Caliphate of Al-Muktafi. Al-Muktafi b'illāh the 'Abbāside Caliph reigned in Baghdād from April, A.D. 902, till August, A.D. 907. This statement conclusively establishes the period at which Rhazes first assumed the duties of physician to the hospital at Baghdād, as being between A.D. 902 and 907.

From this time forward, Rhazes, though travelling about from city to city, spent the greater part of his life, according to Ibn Abī 'Uṣaibī'a, 'in Persia, because of its being his birthplace and the country of his family.' He attended most of the nobles of the Persian courts, as well as the kings of his time, and while in Persia composed many works on medicine and other subjects. Among these is his *Al-Manṣūrī*, which 'he wrote for Mansūr b. Isma'il ibn Khāqān, lord of Khurāsān, and Māwarā'nnahr' [No. 98]. This attribution is not correct; the person for whom *Al-Manṣūrī* was composed was Abū Ṣāliḥ Manṣūr bin Ishāq, the nephew of the Amīr Isma'il Sāmānī, whose brother Ishāq was Abū Ṣāliḥ's father. Abū Ṣāliḥ had been appointed governor of Rayy by his uncle Isma'il Sāmānī.

Ibn Abī 'Uṣaibī'a continues, 'He composed the book which he named *Al-Mulūkī* ('the Royal Book') for 'Alī bin Ṣāhib-i-Ṭabaristān' [No. 52]. 'He also studied philosophical sciences, upon which he wrote many treatises which testify to the profundity of his knowledge and the loftiness

¹ A. D. 976-1008.

of his dignity. He also, in his earlier days, devoted himself to chemical science ('Ilmu-s-Sîmiyā va'l Kîmiyā) and alchemy, and the allied sciences, and there exist works of his on those subjects' [Nos. 32, 33, 34, 35, 38, 40, 91, 113, 184, 197].

He is reported to have said that 'No man deserves the name of "philosopher" unless he be an adept in theoretical and applied chemistry'. The story goes that Rhazes, on one occasion, sold to certain persons of Rūm some ingots of gold which they took to their own country. Several years later, on finding that the gold had changed colour somewhat, they brought it back, and insisted on his taking it back from them.

Rhazes also made use of his chemical knowledge for gastronomical purposes, for we are told that he once entertained a certain vizīr, and the food was so excellent that the vizīr suborned the cook-maid, and induced her to enter his service. She could not, however, serve up such a dinner as he had eaten as Rhazes' guest. So he sent for her and asked her the reason, when she replied that there was no difference in the method of cooking, but that in Rhazes' establishment all the cooking-pots were of gold or silver, and that this was the reason why in his house the food tasted so much better. 'Thereupon the minister 'sent for Rhazes and asked him to impart to him the secrets of his chemical knowledge. Rhazes, however, refused and denied the possession of any such knowledge, whereupon the vizīr had him secretly strangled!'

We are not told whether Rhazes possessed the secret of the transmutation of metals, but if so it must have been of service to him in one of his occupations, that of a banker. Ibn Abī 'Uṣāibi'a tells us that he once met with an old copy of the *Al-Manṣūrī*, in which was this entry in the autograph of Rhazes: 'Kunnāsh al-Mansūrī tālīf-i-Muḥammad bin Zakariyā ar-Rāzī aṣ-Ṣairafī' (the Mansūrī composed by Rhāzes the banker). There does not appear to be any other authority for crediting Rhazes with having practised so lucrative a profession.

Towards the close of his life Rhazes suffered from cataract (*bī mā nazala fī 'ainaihi*) and became totally blind in consequence. His friends urged him to submit himself to operation, but he refused, saying, 'No! I have seen so much of the world that I am wearied of it.'

The story of the oncoming of his blindness is related by Ibn Khallikān, on the authority of Ibn Juljul, as follows:—

Ar-Rāzī composed for Al-Manṣūr a treatise establishing the certainty of the science of Alchemy [probably No. 32]. He set out from Baghdād to present the work to Al-Manṣūr, who expressed his gratification, and after presenting the author with a thousand dīnārs (£500) directed him to produce the substances described in the work. Rhazes replied that to do this he would require ample funds, and various apparatus, as well as reagents of genuine quality, and moreover, all the procedure must be carried out *secundum artem*; he therefore begged to be excused. Manṣūr, however, was not to be denied, and promised that Rhazes should be

furnished with everything he might require. The unhappy alchemist had no option but to comply with the prince's demands, and set about his task, but his experiments were a hopeless failure.

Manṣūr accordingly sent for him and loaded him with reproaches, saying, 'I should never have thought a philosopher capable of deliberate falsehood in a work represented by him as a scientific treatise, in order to engage people's hearts in a labour from which they can derive no advantage. I have given you a thousand *dīnārs* as a reward for this visit, and for the trouble which you have taken, but I shall assuredly punish you for thinking it lawful to lie.'

Saying this, he struck Rhazes on the head with a whip and sent him away to Baghdād. As a result of the blows a 'descent of humour' took place into Rhazes' eyes, with the result already related.

According to a contemporary authority (Abul Khair al-Ḥasan b. Suwār b. Bābā), Rhazes' death took place 'about the year A.H. 300 (A.D. 912) or after'. Ibn Khallikān, however, assigns A.H. 311 (A.D. 923) as the year of Rhazes' death, and states that till the end of his life he continued at the head of his profession.

Physical Characteristics. The only mention to be found of Rhazes' physical characteristics is the statement of Muḥammad b. al-Ḥasan al Wāriq, that Rhazes was 'a man with a large head', and that 'he suffered from a moistness of the eyes owing to excessive fondness for eating beans'.

The same authority states that Rhazes was courteous and affable to every one, and exceedingly kind to the poor, upon whom he used to bestow bountiful allowances and gratuitous medical attendance, and made no distinction of rank or position in his patients.

Intellectual Qualities. Ibn Abī 'Uṣaibi'a says on this head: 'Rhazes was very clever and intelligent, compassionate to the sick and strenuous in his efforts to cure them as far as in him lay; assiduous in the study of the abstruse problems of the art of medicine, and in the elucidation of its hidden truths and secrets, as well as those of other branches of philosophical science. His chief anxiety and care was to study what the most famous learned men, such as Hippocrates and Galen, had written in their works, so that he made himself master of such knowledge as falls to the lot of very few physicians.'

Another writer says of him: 'He was the ablest physician of his age, and the most distinguished; a perfect master of the art of medicine, skilled in its practice, and thoroughly expert in its principles and rules. Pupils travelled from distant countries to benefit by his tuition.'

The wide range of his erudition is shown by the variety of subjects upon which he is known to have written. Not only did he write on medicine, surgery, anatomy, physiology, materia medica, dietetics, hygiene, and therapeutics, but we find his name associated with works on philosophy, both general and speculative, natural philosophy,

psychology, mathematical science, logic, ethics, metaphysics, religion, grammar, music, chess, and draughts, so that we may fairly apply to him Dryden's descriptive line—

‘Not one, but all mankind's epitome.’

Character. The inner character of Rhazes may best be learned from a consideration of the few sayings of his which have come down to us.

Earnestness in study seems to have been the main object of his own life, as it was the key-note of all his teaching, to the end that truth may be attained.

‘Truth’, he says, ‘is a goal which cannot be attained in the medical art to the cure of disease without careful study of the written precepts of others put to the test of practical experience.’

‘Careful and prolonged study of the writings of physicians and philosophers, and a probing of their secrets, is of service to every physician of eminence.’

‘If any man fails to devote himself wholly to the study of natural phenomena and philosophical sciences and the rules of logic, and turns aside to the pleasures of the world, he should be regarded with suspicion as regards his knowledge of medicine, but especially as regards its practice.’

Though accepting the guidance of the bygone teachers, he inculcates obedience to the dictates of a judgement which has been cultivated and matured by study and practical experience, as we learn from the following maxim of his:

‘When Galen and Aristotle are unanimous in the expression of an opinion, there lies absolute truth, but when they are at variance it is a hard matter to decide, and we should arrive at the proper course of conduct by ratiocination.’

And as a corollary to this he says:

‘The skilled and experienced physician will act upon the promptings of his judgement.’

That Rhazes was conservative in his methods appears from one of his maxims for the use of drugs, which in his time were almost exclusively of vegetable origin. ‘Life’, he says, ‘is too short for acquiring a knowledge of the properties of all the herbs which grow on the earth. One should therefore use those whose properties are well known, and avoid the employment of rare and less proved plants, confining oneself mainly to those of which one has personal experience.’

But, while not despising the use of drugs, Rhazes strictly inculcates the avoidance of such aids in cases where they can be dispensed with, laying down the rule that the aim of the physician should be to cure by diet rather than by drugs, while no fewer than fourteen of his written

works dealt with this important subject of dietetics and alimentation, both in health and disease.

In one work he treats of the order in which various articles of food, fruits, &c., should preferably be eaten [No. 80]. In another work he deals with the general question of the alimentary values of various food-stuffs, and of the means of combating any hurtful principles they may possess which might give rise to digestive troubles [No. 161]. A third deals with the question of eating dessert [No. 195a], while yet another treatise is devoted to the question of milk [No. 206]. He also inquires into the causes of thirst, among which he includes the use of fresh fish as an article of diet [No. 103], and in another explains the mistaken opinion that snow causes thirst [No. 116]. In a pamphlet [No. 104] Rhazes discusses the effects of wine, of which he says there is no variety which is not an intoxicant, and lays down that in many ways it is useful and promotes bodily health [No. 166]. In [No. 210] *Maqālat fi'l mazāqāt* he deals with the question of tastes. He lays special stress upon the importance of consulting the likes and dislikes of the patient in the matter of food, especially during the period of convalescence. On this point he says: 'In dealing with persons who are convalescing from sickness, if they should long for some food which would be harmful to them, the physician must devise some means of so modifying that particular food as to annul its harmfulness, but should not wholly withhold it.'

In the treatment of the sick, cheerfulness on the part of the physician is, says Rhazes, absolutely essential. 'It behoves the wise physician to inspire the sick person with hopes of recovery, even though he himself feels doubtful of such a fortunate event, because the body is reacted upon by the mind.' The wisdom of this maxim will be readily acknowledged by us all. Another quality urged as essential to the physician is that of patience, and unfailing resource, in the diagnosis and treatment of disease. 'He must not give up studying the problem of the sickness of a patient without employing every possible means of ascertaining its causes, both extrinsic and intrinsic, avoiding empiricism, and availing himself of the knowledge he has acquired from the study of the written works of others,' which study, he says in another place, 'will store his mind as though he had lived and practised his art for a thousand years.'

Finally, says Rhazes, 'the physician must be a man of moderate views, not entirely devoted to the things of this world and not averse from that which concerns the next world. He should also keep a middle course between self-indulgence and self-mortification.'

While thus realizing the high dignity of his profession, and the demands it makes upon the physician in both the intellectual and moral spheres, Rhazes has also a word to say to the public in reference to the duty of the patient to the physician, which may with advantage be repeated after this interval of ten centuries. 'The sick man', says Rhazes, 'should seek for a physician in whom he has confidence, and

ould confine himself to the advice of that physician, for if he consults a number he runs the risk of falling a victim to the errors of each one of them, error being inseparable from the human nature of even the wisest, whereas in the case of the individual skilled practitioner his errors will be insignificant in comparison with the general accuracy of his judgement; moreover, the patient who has recourse to a number of physicians evidences a want of confidence, which will assuredly end in his distrusting them all.

He also devotes three treatises to the subject of Quacks, whom he denounces in no measured terms, saying that 'they are so numerous that an entire work might be written upon their impostures, and no wise man ought to trust his life in their hands nor take any of their medicines which have proved so fatal to many'. In one of these treatises he discusses the reasons why most people seem more disposed to run after quack-doctors than to avail themselves of the services of the most eminent physicians [No. 79], or even to make the wisest and ablest of them the object of their censure [No. 121]. While in a letter [No. 125] he explains the reason why in some cases 'inexperienced physicians and even women in certain cities are more successful in their treatment than the most learned physicians', and, while regretting that this sometimes appears to happen, he maintains that it is not the fault of the physician.

The few anecdotes which we find recorded may serve to throw a little light upon the character of Rhazes and his methods. At-Tanūkhī,¹ the author of *al-Faraj b'ad ash-Shidda* ('Rest after distress'), a collection of anecdotes, is quoted by Ibn Abī 'Uṣaibi'a as having related that Rhazes was once called in to see a boy who on his journey from Baghdād to Rayy had been seized with blood-spitting. Physical examination yielded no signs of phthisis or ulceration, and Rhazes was at a loss to diagnose the disease. On asking the boy some particulars of his journey, he learned that he had drunk water from a pond *en route*, and came to the conclusion that a leech was the source of the trouble. Directing the boy to come back on the morrow, promising him that if he would obey Rhazes implicitly his cure was assured, Rhazes made his preparations. He procured two large wash-tubs full of chickweed, and when the boy made his appearance on the following morning, said to him, 'Now swallow the contents of these two tubs.' The boy, somewhat reluctantly no doubt, swallowed as much as he could and stopped. 'Go on,' said Rhazes. 'I can't swallow any more,' replied the boy. Whereupon Rhazes directed his attendants to seize the boy and lay him on his back. This done, Rhazes forced the boy's mouth open and compelled him to swallow the entire contents of one of the tubs 'in spite of his cries for mercy, to which Rhazes responded by threats of bodily chastisement'. At last the boy vomited, and on examining the vomited matter, Rhazes found the leech which, as our author says, 'was attracted by the chickweed and induced to leave the boy's stomach.'

¹ Abū 'Alī Muḥsin at-Tanūkhī (A.D. 939-94), born at Baṣra.

A further story is related by the same author of a boy who was suffering from dropsy and of whose cure Rhazes had despaired.

By the boy's bedside his nurse had left a basin of sour milk, and while he was lying alone in the room, he saw a snake come in and discharge its venom into the milk. Being tired of life, and thinking to end his troubles by this means, the boy rose from his bed and drank off the poisoned milk. As a result he was seized with violent purging 'to the extent of a hundred motions in the twenty-four hours following'. He then fell into a deep sleep which lasted several hours, and woke in a profuse perspiration. Gradually he regained strength, and in the end was completely cured of his dropsy, 'his belly cleaving to his back', as the account has it.

Rhazes' comment on this was 'I was astonished, but I mentioned to the boy's father that it has been said by the ancients that if a dropsical person eats the flesh of a serpent of the age of a hundred years or more he will be cured. 'But', said I, 'I did not like to tell you this, for you might have thought I was trifling with you, and would assuredly have asked me how to tell the age of a serpent, so I held my peace and said nothing.'

In the *Qābūs nāma*¹ the following story is related :—

Muḥammad Zakarīyā ar-Rāzī (Rhazes) was one day walking with a party of his pupils when they happened to encounter a madman who would look at no one save Muḥammad Zakarīyā, into whose face he looked earnestly and smiled. Zakarīyā came back to his house and ordered them to prepare a decoction of Aftīmūn² (Gk. ἐπιθυμον—the dodder of thyme, reputed by Dioscorides³ to be a remedy for mental diseases) which he drank. His pupils inquired of him why he drank it. His reply was 'Because of the laughter of that madman, who would not have

¹ Tihān Ed., p. 37. Its author was the Ziyāride Kaikā'ūs, who wrote the work A.D. 1082 as a rule of life for his son Gilānshāh.

² افتيمون.

³ 'Ἐπιθυμον. ἄνθος ἐστὶ θυμου τοῦ σκληροῦ—καὶ θύμβρας ἐοικώς. ἔστι δὲ κεφάλια λεπτὰ κοῦφα. [οὔρακούς] ἔχοντα ὡς τρίχας. καθαίρει δὲ πνύμενον κάτω, φλέγμα, καὶ χολὴν μέλαιναν, ιδίως ἀρμόζον ἐπὶ μελαγχολικῶν, ἐνπνευματουμένων, ὀξοβάφου πλήθος, πρὸς ὀλκὴν τεσσάρων δραχμῶν, ἐν μέλιτι καὶ ἄλσι καὶ ὀλίγῳ ὕει. γεννᾶται δὲ πλεῖστον ἐν Παμφυλίᾳ.

From the Vienna Facsimile Edition of Dioscorides in the Bodleian Library.

The word οὔρακούς is of doubtful accuracy.

A long discussion of the question whether from the description given by Dioscorides (as quoted here) we are to understand by Epithymum the flower of thyme itself, that is to say of the variety of thyme which resembles Thymbra (*Satureia thymbra*, Savory, see pp. 413, 414 *op. cit.*); or whether it should be taken to refer to a species of *Cuscuta* which grows as a parasite upon thyme, will be found in Matthioli's Commentary on the books of Dioscorides at pp. 668–71.* The conclusion at which he arrives is that it is the parasite which is intended by Dioscorides.

* *Commentaires de M. Pierre Andre Matthioli, Médecin Senois, sur les six livres de Ped. Dioscoride*, etc.—à Lyon par Guillaume Rouille M.D.LXXII.

For the loan of this work I am indebted to the kindness of Sir William Osler, Bart.

For the transcription from the Vienna Dioscorides, I have to thank Dr. Cowley, Sub-Librarian of the Bodleian Library.

With reference to *Cuscuta Epithymum*, see Ibn Baīṭar (Sonthheimer), ii. 380, s.v. كشكوت.

smiled at me had he not perceived in me some trace of his own insanity, in accordance with the saying "Every bird flies with its like" (كل طائر يطير مع شكلة).

THE WRITTEN WORKS OF RHAZES.

The number of works composed by Rhazes, as recorded by Ibn Abi 'Uṣaibi'a, is two hundred and thirty-two. These are given in detail below in a list which includes that given in a translation by Solomon Negri,¹ which latter, however, is not quite complete, as he has inadvertently omitted a few works. These discrepancies are noted as they occur. For the loan of the Manuscript of Solomon Negri's work, I am indebted to the authorities of the Hunterian Library of the University of Glasgow, who most kindly acceded to my request to borrow the MS. I have to thank, not only them, but also Professor Galbraith of the Glasgow University Library, Keeper of Hunterian Books and MSS.; and also Professor Sir William Osler, Bart., Regius Professor of Medicine of the University of Oxford, through whose kind intermediary I was enabled to procure the loan of the MS. Also, Professor Margoliouth, who has kindly given me much help with the notes in the list of works.

The MS. in question is No. 44. *Salomonis Negri, Vitæ et Opera Medicorum Arabicorum, videlicet . . . Muḥammad ibn Zakariya (Abu Bakr) Rāzī (Errāzī)*. The other four biographies contained in this work are those of Bakhtishu ibn Djabrīl, Ḥunain ibn Ishaq (Ioannitius), Yuhanna ibn Masawaiah (Mesue), Abdullah ibn Aḥmad ibn al Baitār [see Aitken's Catalogue, p. 51].

¹ Salomon Negri (Sulaimān Alsādī) was a priest of the Greek Church and an interpreter who died in the year A.D. 1729. His *Vitæ et Opera Med. Arab.* is a Latin translation from the Arabic of Ibn Abi 'Uṣaibi'a. Folio written on half-margin. The portion relating to Rhazes occupies ff. 1-19 b.

LIST OF THE WRITTEN WORKS OF RHAZES AS GIVEN IN IBN ABI 'UṢAIBI'A'S '*Uyūnu-l-Aubā fi Ṭabaqāti-l-Aṭibbā*, TOGETHER WITH THE LIST AS GIVEN BY SALOMON NEGRI IN HIS MS. TRANSLATION OF THIS WORK.

N.B.—Reference may be made with advantage to the *Fihrist* for further details concerning certain of these works. (M.) indicates Professor Margoliouth as the source of information.

IBN ABI 'UṢAIBI'A.

- I. كتاب الحاوى وهو اجل كتبه و اعظمها فى صناعة الطب و ذلك انه جمع فيه كل ما وجدته متفرقا فى ذكر الامراض و مداوااتها من سائر الكتب الطبية المتقدمين و من اتى بعد هم الى زمانه و نسب كل شئ نقله فيه الى قائله هذا مع ما ان الرازى تو فى و لم يفسخ له فى الاجل ان يحدد هذا الكتاب

[Müller says in his preface that Rhazes was indebted to the celebrated Hindū physician Susruta¹ for much that is contained in this work.]

¹ Susruta II, second century A.D.

SALOMON NEGRI.

- I. Liber collectaneorum dictus Com-
plectens. Estque omnium ipsius libro-
rum de arte medicâ præstantissimus
atque maximus, quia in eo collegit
quidquid invenerit dispersum circa
cognitionem morborum et eorumdem
curationem, ex omnibus antiquorum
de Medicinâ libris et eorum qui post
illos prodierunt usque ad ipsius ætatem,
et quidquid in eo conguessit ad suum
quemque authorem retulit: quamvis
supremum obierit diem, nec per fatum
illis licuerit librum hunc describere.

IBN ABĪ 'UṢAIBI'A.

SALOMON NEGRI.

2. كتاب البرهان مقالستان الاولى سبعة عشر
فصلاً و الثانية اثنا عشر فصلاً

3. كتاب الطب الروحاني و يعرف ايضا بطب
النفوس غرضه فيه اصلاح اخلاق النفس و هو
عشرون فصلاً

4. كتاب في ان للانسان خالقاً متفناً و فيه
دلائل من التشريح و منافع لاعضاء تدل على
ان خلق الانسان لا يمكن ان يقع بالاتفاق

5. كتاب¹ سمع الكيان غرضه فيه ان يكون
مدخلاً الى العلم الطبيعى و مسهلاً للمتعلم لحوق
المعاني المتفرقة فى الكتب الطبيعية
¹ (M.) [سمع الكيان = φυσικὴ ἀκρόασις. The
'physical discourse' of Aristotle.] G. R.

6. كتاب يساغوجى و هو المدخل الى المنطق
جمل المعانى قاطيغورياس — جمل معانى
بارمينياس — جمل معانى اناطوطيقا الاولى
الى تمام القياسات للمالية

[This is represented by Salomon Negri's
Nos. 6, 7, 8, and 9.] G. R.

7. كتاب هيئة العالم — غرضه ان يبين ان
الارض كرية و انها فى وسط الفلك و هو
ذو قطبين يدور عليهما و ان الشمس اعظم
من الارض والقمر اصغر منها و يتبع ذلك من
هذا المعنى

8. كتاب في من استعمل تفضيل الهندسة من
الموسومين بالهندسة و بوضع فيه مقدارها
و منفعتها و يرد على من رفعها فوق قدرها

9. مقالة فى السبب فى قتل ريس السموم
لاكثير الحيوان

2. Liber Demonstrationis in duos
Tractatus. I. septemdecim. II. duo-
decim continet sectiones.

3. Liber de medicinâ Spirituum—
dicitur quoque Medicina animorum;
scopus ejus in eo est morum animæ
emendatio correctioque et in viginti
sectiones est dispositus.

4. Liber quòd homo habeat condi-
torem ac opificem sapientissimum.
In eo afferuntur demonstrationes ex
Anatomiâ desumptæ et ex utilitate et
usu membrorum quæ probant fieri non
posse ut hominis natura conditiove
casu existat.

5. Liber de Universalibus sive de
rerum existentia. Scopus ejus in eo
est ut sit Introductio ad scientiam
naturæ, et ut faciliem reddat intelligen-
tiam sensuum dispersorum in libris de
naturâ conscriptis.

6. Liber Isagoge estque introductio
ad logicam—Summa sensuum Catego-
rizarum—Summa sensuum libri de In-
terpretatione—Summa libri Analyti-
corum primi et complexio Syllogis-
morum.

[Compendium of Aristotle's Cate-
gories, 'Analytica', and 'On Interpreta-
tion'. پارمينياس = περί ἑρμηνείας.] G. R.
(M.)

7. De formâ Mundi. Scopus ejus
in eo est ostendere terram esse sphæri-
cam eamque in medio orbis cælestis,
atq: hunc duobus polis præditum
super illos circumvolvi: Solem terrâ
majorem Lunam Sole minorem: et
quæ sequuntur in ejusmodi argumento.

8. Liber adversus insignes Mathe-
maticos quibus usu venit Mathemati-
cam artem præferre aliis quibusque et
in eo præstantiam illius artis et utilita-
tem demonstrat confutatque illos qui
eam supra modum extollunt.

9. Tractatus de causâ cur ventus
fervens interficiat pleraque animalia.

IBN ABĪ 'UṢAIBI'A.

10. كتاب في ما جرى بينه وبين سيمس المناني¹ يريه خطأ موضوعاته وفساد ناموسه في سبع مباحث

¹ [Read here المناني (M.). G. R.]

11. كتاب في اللذة — غرضه فيه ان يبين انها داخله تحت الراحة

12. مقالة في العلة التي لها صار الحريف ممرضا و الربيع بالصد على ان الشمس في هذين الزمانين في مدار واحد صنفها لبعض الكتاب

13. كتاب في الفرق بين الرويا المنذرة وبين سائر ضروب الرويا

14. كتاب الشكوك و المناقضات الستى فى كتب جالينوس

15. كتاب فى كيفية الابصار يبين فيه ان الابصار ليس يسكون يشعاع يخرج من العين و ينقض فيه اشكالا من كتاب اقليدس فى المناظر

16. كتاب فى الرد على الناشى — فى مسائله العشر التي رام بها نقص الطب

¹ Abu'l 'Abbās ibn Shirshir, known as An-Nāshī al-Akbar, a native of Baghdād, famed for his skill in dialectics. Died A. D. 906.

17. كتاب فى علل المفاصل و النقرس و عرق النسا وهو اثنان و عشرون فصلاً

18. كتاب اخر صغير فى وجع المفاصل

19. الاثنا عشر كتابا فى الصنعة

20. كتاب المدخل التعليمى ١

21. كتاب المدخل البرهانى ٢

22. كتاب الاثبات ٣

23. كتاب التدبير ٤

SALOMON NEGRI.

10. Liber de iis quæ seipsum inter et Sissum El-Methani¹ evenere, in eo intendit ostendere absurditatem illius propositionum et pravitatem ejus regularum. In septem disputationibus.

¹ [Read Sisinium, the Manichæan (Fihrist)] (M.). G. R.

11. Liber de Voluptate: mens ejus est in eo probare illam quiete contineri.

12. Dissertatio sive Tractatus de causâ ob quam fit ut Autumnus in morbum conjiciat et vernum tempus contrâ — eò quòd Sol in his duabus tempestatibus sit in eodem circumeundi loco. Scripsit illum pro Notariis quibusdam.

13. Liber de discrimine inter somnia præmonentia et alia somniorum genera.

14. Liber de dubiis et contradictionibus quæ inveniuntur in Galeni libris.

15. Liber de qualitate Visuum: in eo demonstrat quod visus non sint per radium qui prodeat ex oculo; et dissolvit aliquas figuras ex libris Euclidis qui opticam attingit.

16. Liber Responsio ad El-Nāshī¹ in questionibus decem quibus voluit evertere Medicinam.

17. Liber de Podagra, Ischiade et Arthriti et est in duodecim capita divisus.

18. Liber alius parvus de Arthriti.

19. Libri duodecim de Arte Medicâ.

20. *Primus*. Introductio ad Doctrinam.

21. *Sec.* Introductio ad Demonstrationes.

22. *Tert.* De Probationibus.

23. *Quart.* De medicatione et modo tractandi.

IBN ABĪ 'UṢAIBI'A.

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24. كتاب الحجر ٥
25. كتاب الأكسير عشرة ابواب ٦
26. كتاب شرف الصناعة و فضائها ٧
27. كتاب الترتيب ٨
28. كتاب التدابير ٩
29. كتاب الشواهد و نكت الرموز ١٠
30. كتاب المحبة ١١
31. كتاب الخيل ١٢
32. كتاب فى ان صناعة الكيمياء صناعة اقرب الى الوجود من الامتناع سماء كتاب الاثبات
33. كتاب الاحجار يبين فيه الايضاح عن الشئ الذى يكون فى هذا العمل
34. كتاب الاسرار
35. كتاب سر الاسرار
36. كتاب التبويب
37. كتاب رسالة الخاصة
38. كتاب الحجر الاصغر [G. R. (sic) الأصغر?] [The reading here is uncertain. S. N. translates اصفر. If we read اصغر which may mean Silver we must translate 'The Book of the Lesser Stone'.] G. R.
39. كتاب رسائل الملوك
40. كتاب الرد على الكندى فى ادخاله صناعة الكيمياء فى الممتنع

24. *Quint.* De ciborum abstinentiâ.
25. *Sext.* De Elixir in decem capita.
26. *Sept.* De præstantiâ et nobilitate artium sive Al-Chymîæ sive Medicæ.
27. *Oct.* De ordinatione.
28. *Non.* De regiminibus sive de dietâ.
29. *Dec.* De rebus cognitis perspectisque et de solutione Ænigmatum vel Allegoriarum.
- The meaning of شواهد is technically 'evidential examples' (of words or phrases). G. R.
30. *Undec.* De Amicitîâ vel Amore.
31. *Duodec.* De Technis. [On mechanics?] G. R.
32. Liber de Al-Chymîâ quod ars illa propior sit ad possibile quam ad impossibile. [To it he gave the name of Kitâbu-l Isbât (The Book of Proof), see No. 22 above.] G. R.

33. Liber de lapidibus [Philosophicis] in eo declarat illam rem quâ fit hoc opus.

34. Liber mysteriorum.

35. Liber arcanum arcanorum.

36. Book on Classification.

[N.B. This is probably the correct reading. Salomon Negri translates *Liber de Prophetiâ*, having read the word تبويب as نبويت.] G. R.

37. Epistola singularis seu privata.

38. De lapide Croceo Philosophorum.

39. Liber Epistolarum Regum.

40. Liber. Responsio ad Philosophum el-Kendi eo quod artem al-Chymîæ in impossibili posuerit.

[Ya'qûb b. Ishâq al-Kindî, known as 'The philosopher of the Arabs', c. A.D. 850.] G. R.

IBN ABĪ 'UṢĀIBI'A.

SALOMON NEGRI.

41. كتاب في ان الحمية المفترطة و المبادرة الى الادوية و التقليل من الاغذية لا يحفظ الصحة بل يجلب الامراض
41. Liber. Quod abstinentia modum excedens et properatio ad remedia et avocatio ab alimentis non servant valetudinem sed morbos adferant.
42. مقالة في ان جهال اطباء يشددون على المرضى في منعهم من شهواتهم و ان لم يكن بالانسان كثير مرض جهلاً و جزافاً
42. Tractatus quod medicorum imperiti durius constringant ægros cum interdicut illis appetitus eorum; et quod nullus sit in homine major morbus quam ignorantia et temeritas.
43. كتاب سيرة الحكماء
43. Liber. De Vitiis medicorum sive de ipsorum vivendi ratione et moribus.
[On the Rule of Life of Physicians or Philosophers.] G. R.
44. مقالة في ان الطين المتشقل به فيه منافع الفها لابي حازم القاضي
44. Dissertatio quòd Lutum translutum contineat utilitates. Scripsit illam in gratiam Abi Hazim judicis.
45. مقالة في الجدري و الحصبة اربعة عشر باباً
45. Dissertatio de Variolis et Morbillis in quatuordecim capita.
46. مقالة في الحصى فى الكلى و المثانة
46. Dissertatio de calculis in renibus et vesicâ.
47. كتاب الى من لا يحضره طبيب و غرضه ايضاح الامراض و توسيع فى القول و يذكر فيه علة علّة و انه يمكن ان يعالج بالادوية الموجودة و يعرف ايضاً بكتاب طب الفقراء
47. Liber pro eo qui medicum in promptu non habet. Est etiam mens ejus explicare morbos et amplificare de iis sermonem: in eo enim singulos recenset morbos et possibile esse asserit illos curari per obvia remedia. Appellatur quoque hic liber, Medicina Pauperum.
[See No. 215 *post.*] G. R.
48. كتاب الادوية الموجودة بكل مكان يذكر فيه ادوية لا يحتاج الطبيب للحاذق معها الى غيرها اذا ضم اليها ما يوجد فى المطابخ و البيوت
48. Book on Medicines which are to be found in every house. In this work he mentions medicines which render a clever physician independent of any other drugs when he adds to them what is to be found in kitchens and houses.
[N.B. Salomon Negri overlooked this work in his translation.] G. R.
49. كتاب فى الرد على الجاحظ فى نقص صناعة الطب
- 49 [S. N. 48]. Liber. Responsio sive Confutatio libri a Giahezo conscripti de evertendâ Medicinâ.

IBN ABĪ 'UṢAIBI'Ā.

50. كتاب في تناقض قول الجاحظ في كتابه
في فضيلة الكلام و ما غلط فيه على
الفلاسفة

51. كتاب التقسيم و التشجير يذكر فيه تقاسيم
الامراض و اسبابها و علاجها بالشرح و البيان
على سبيل تقسيم و تشجير

52. كتاب الطب المسلوكي في العلل و علاج
الامراض كلها بالأغذية و دس الادوية في
الاغذية حيث لا يدمنها و ما لا يكرهه
العليل

53. كتاب في الفالج

54. كتاب في اللقوة

55. كتاب في هيئة العين

56. كتاب في هيئة الكبد

57. كتاب في هيئة الانثيين

58. كتاب في هيئة القلب

59. كتاب في هيئة الصماخ

60. كتاب في هيئة المفاصل

SALOMON NEGRI.

- 50 [S.N. 49]. Liber contradictionibus
Giahezi in libro suo de metaphysicâ et
de iis quæ Philosophis perperam at-
tribuit.

[Nos. 49 and 50 were written in con-
futation and criticism of 'Amr-b. Baḡr
al-Jāhiḡ of Baṣra, author of Kitābu-l-
Ḥayawān (Book of Animals), d. A.D.
869.] G. R.

- 51 [S.N. 50]. Liber. De Exorcismis,
Fascinationibus, et Incantamentis. In
eo commemorat morborum exorci-
smos et eorum causas curationesque
(explanatione et dilucidatione adhibitâ)
per exorcismos fascinationes et artes
magicas.

[The above is S. N.'s translation,
which appears inaccurate. It should
be Book of Divisions and Branches, in
which he deals with the divisions of
Diseases and their Causes and Treat-
ment, with a commentary in explana-
tion, arranged according to divisions
and branches. This is the 'Liber
Divisionum'. See Brit. Mus. Cat., fol.
7320 h, &c.] G. R.

- 52 [S.N. 51]. Liber. De medicinâ
Regiâ. In eo meminit de morbis et
curatione omnium morborum per vi-
ctum et de abhendis in alimentis, necessi-
tate id exigente, medicamentis atque in
iis maxime quæ non abhorreat ægrotans.

- 53 [52]. Liber. De Paralyysi seu He-
miplexia.

- 54 [53]. Liber. De morbo faciei, sive
de torturâ oris et Convulsione Caninâ.
[On Facial Paralysis.] G. R.

- 55 [54]. Liber de formâ Oculi.

- 56 [55]. Liber. De formâ Hepatis.

- 57 [56]. Liber. De formâ testium.

- 58 [57]. Liber. De formâ cordis.

- 59 [58]. Liber de formâ meatus
auditorii.

- 60 [59]. Liber de formâ articulorum
corporis.

IEN ABĪ 'UṢAIBI'A.

SALOMON NEGRI.

61. اقرا بادين C1 [60]. Liber de medicamentis compositis sive Antidotis.
62. كتاب فى الانتقاد و التحريض على المعتزلة 62 [61]. Liber de acceptione paratae pecuniae et de Chirographo adversus sectam Motazelitarum seu Schismaticorum.
63. كتاب فى الخيار المر 63 [62]. Liber. De cucumeri amaro.
64. كتاب فى كيفية الاغتذا و هو جوامع ذكر الادوية المعدنية 64 [63]. Liber. De qualitate Nutritionis estque summa recensionis medicamentorum mineralium.
65. كتاب فى اثقال الادوية المركبة 65 [64]. Liber. De usu remediorum compositorum.
[Of the weights of compound medicines.] G. R.
66. كتاب فى خواص الاشياء 66 [65]. Liber. De proprietatibus Rerum.
67. كتاب كبير فى الهيولى 67 [66]. Liber maximus de Hyle sive de Materiâ primâ. [ἕλη] G. R.
68. كتاب فى سبب وقوف الارض وسط الفلك على استدراة 68 [67]. Liber de statione terrae in medio orbis caelestis gyros ducendo.
69. كتاب فى نقص الطب الروحاني على ابن اليمان 69 [68]. De evertendâ Medicinâ adversus Ali b. Ettemar (*sic*). [Book in refutation of the 'Spiritual Medicine' of Ibn al-Yamān.]
[I am indebted to Professor Margoliouth for the following:—'In the *Fihrist* the author of the "Spiritual Medicines" refuted by Rāzī is said to have been Abū Bakr Muḥammad b. al-Yamān, *ob.* 268.'] G. R.
70. كتاب فى ان العالم لا يمكن ان يكون الا على ما نشاهده 70 [69]. Liber. Quòd fieri non possit ut mundus existat nisi eo quo illum spectamus modo.
71. كتاب فى الحركة و انها ليست مرئية بل معلومة 71 [70]. Liber de Motu quod non sit ordinatus sed cognitus et certus.
[N.B. S. N. apparently read مرئية for مرئية. Accepting the reading مرئية we must translate 'Book treating of Motion, which even though not visible is nevertheless a matter of knowledge'. Professor Margoliouth informs me that the *Fihrist* also has the reading مرئية.] G. R.
72. مقالة فى ان العجسم تحريكاً من ذاته و ان الحركة مبداء طبيعى 72 [71]. Dissertatio quod corpori infit commotio à se ipso et quod motus sit principium naturale.

IBN ABĪ 'UṢAIBI'A.

SALOMON NEGRI.

73. قصيدة في المنطقيات 73 [72]. Poema sive Carmen. De rebus Logicis.
74. قصيدة في العلم الالهى 74 [73]. Poema sive Carmen de Scientiâ Divinâ, sive Metaphysicâ vel Theologiâ.
75. قصيدة في الغطة اليونانية 75 [74]. Carmen de Exhortatione Græcâ. [With regard to this work Professor Margoliouth writes to me : 'I suspect the reference to be to Tatian's *Cohortatio ad Gentes*, though I do not know why Râzî should versify it.'] G. R.
76. كتاب الكرى و مقادير مختصرة 76 [75]. Liber de Sphæris et mensuris compendiosis.
77. كتاب في ايضاح العلة التى بها تدفع الهوام بالتغذى و مرة التدبير 77 [76]. Liber de declaratione morbi in quo pellitur sitis victu et nonnunquam medicatione.
78. كتاب في الجبر وكيف يسكن المله و ما علامة الحر فيه و البرد 78 [77]. Liber de religatione ossium fractorum et quomodo conquiescat illius dolor et quodnam in eo sit signum caloris frigorisve.
79. مقالة في الاسباب المهيئة لقلوب أكثر الناس عن افاضل الاطباء الى اخسائهم 79 [78]. Dissertatio de causis quæ plerorumque hominum animos à præstantissimis ad viliores quosque medicos solent deflectere.
80. مقالة في ما ينبغي ان يقدم من الاغذية و الفواكه و ما يؤخر منها 80 [79]. Dissertatio de eo quod in alimentis et fructibus præferri aut postponi debet.
81. مقالة في الرد على احمد بن الطيب السرخسى فيما رد به على جالينوس في امر الطعم المر 81 [80]. Dissertatio et responsione ad Ahmetum bin Et-Tabib Essargialsi (*sic*) ad ea præsertim quibus confutavit Galenum de gustu amaro.
[We should read here احمد بن الطيب السرخسى. Ahmad bin al-Ṭayyib as-Sarakhsī, died A.H. 286 (A.D. 899). He was put to death by the Caliph Al-Mu'tazid, who accused him of attempting to lead him into heresy. See Yāqūt's *Dictionary of Learned Men* (Margoliouth), i. 158.] G. R.
82. كتاب في الرد على المسعى المتكلم في رده على اصحاب الهنولوى 82 [80 a]. Liber. De Responsione ad El-Massmai¹ Metaphysicæ professor (*sic*) in confutatione sua adversus Materiæ primæ patronos.

¹ [Abu Yā'la Muḥammad b. Shaddād al-Misma'ī, ob. A.H. 298 or 299.] (M.) G. R.

IBN ABĪ 'UṢĀIBI'A.

85. كتاب في المدة وهى الزمان و فى الخلاء و
الملاء و هما المكان

84. مقالة اiban فيها خطا جرير الطيب فى
انكاره مشورة على الامير احمد بن اسمعيل
فى تناول التوت الشامى على اثر البطيخ فى
حاله و ايضاح عذره فيها

85. كتاب فى نقص كتاب انا بو الى ففوربوس
فى شرح مذهب ارسطوطاليس فى العلم
الالهى

86. كتاب فى العلم الالهى

87. كتاب فى الهوى المطلقة و الجزئية

88. كتاب الى ابى القاسم البلخى و الزيادة على
جوابه و جواب هذا الجواب

89. كتاب فى العلم الالهى على رأى افلاطون

90. كتاب فى الرد على ابى القاسم البلخى فى
ما ناقص به فى المقالة الثانية من كتابه فى
العلم الالهى

91. كتاب فى محنة الذهب و الفضة و الميزان
طبيعى

92. كتاب فى الثبوت فى الحكمة

93. كتاب فى عذر من اشتغل بالشطرنج

94. كتاب فى حكمة النرد

94 a. كتاب فى حيل المنمّس
[? المنمّس. No such word as المنمّس exists
in the sense given by S. N.] G. R.

SALOMON NEGRI.

83 [81]. Liber. De Spatio quod est
tempus et de vacuo et pleno quæ ambo
locum constituunt.

84 [82]. Dissertatio in quâ ostendit
culpam alicujus medici [the physician
Jarîr] cûm negasset consilium dare
principi Ahmet Ben Ismail de come-
dendis moris nigris post pepones in
certo casu ac simul ipsum expurgat
excusatque.

85 [83]. Liber de confutatione ex-
plicationis Porphyrii cum exponit sen-
tentiam Aristotelis de Metaphysicâ.

86 [84]. Liber de Metaphysicâ.

87 [85]. Liber de Materiâ primâ
universali auri Minera (*sic*).

[On Primordial matter absolute and
particular.] G. R.

88 [86]. Liber Abul Kassim El-
Balkhi¹ adjecta ad illum responsione et
responsionis responsio.

¹ [See *Fihrist*, p. 299.] (M.) G. R.

89 [87]. Liber de Metaphysicâ se-
cundum Platonis sententiam.

90 [88]. Liber. Responsio ad Abul
Kassim El-Balkhi circa ea in quibus
sibi ipsi contradicit in duabus disputa-
tionibus de Metaphysicâ.

91 [89]. Liber. De probatione auri
et argenti et de pondere naturali.

92 [90]. Liber. De Constantiâ in
Sapientiâ.

93 [91]. Liber. Apologia eorum qui
sese in Latrunculorum ludo occupant.
[Apology for Chess-players.] G. R.

94 [92]. Liber. De arcano ludi
Latrunculorum.

[The strategy of the game of
Draughts.] G. R.

94 a [93]. Liber. De peritiâ pal-
pandi pulsus. [? Of the devices of
body-snatchers.] G. R.

IBN ABĪ 'UṢAIBI'A.

95. كتاب فى ان للعالم خالقاً حكيماً
96. كتاب فى الباء يبين فيه الامزاج و منافع الباء و مضاره
97. كتاب الزيادة التى زادها فى الباء
98. كتاب المنصورى الفقه للامير منصور ابن اسحاق بن اسمعيل بن احمد صاحب خراسان و تجرى فيه الاختصار و الانجاز مع جمعة الجمل و الجوامع و نكت و عيون من صناعة الطب علمها و عملها و هو عشر مقالات

SALOMON NEGRI.

- 95 [94]. Liber. Quòd existat mundi creatur (*sic*) isque Sapientissimus.
- 96 [95]. Liber de Coitu, in eo declarat temperamenta et utilitates coitus noxaeque.
- 97 [96]. Liber. Additamenta ad librum De Coitu.
- 98 [97]. Liber El-Mansūri dictus, composuit eum in gratiam Mansur bin Isaac bin Ismail¹ bin Ahmad Chorasani Domini. In eo sibi proposuit breviter et compendiose agere: quamquam in eo summa artis medicæ et ipsius praxeos contineatur præter collectanea et puncta eruditionis medicinæ et alia ejusmodi.

Liber vero decem constat tractatibus.

¹ Nephew of Ismā'il Sāmānī. His full name was Abū Ṣālih Maṣṣūr b. Ishāq b. Aḥmad. Was governor of Rayy. His father Ishāq was Ismā'il's brother, not his son as here stated. G. R.

المقالة الاولى فى المدخل الى الطب و فى شكل الاعضاء و خلقها

المقالة الثانية فى تعرف مزاج الابدان و هيئتها و الاخلاط الغالبة عليها و استدلالات وجيزة جامع من الفراسة

المقالة الثالثة فى قوى الاغذية و الادوية

المقالة الرابعة فى حفظ الصحة

المقالة الخامسة فى الزينة

المقالة السادسة فى تدبير المسافرين

المقالة السابعة جمل و جوامع فى صناعة الجبر و الجراحات و القروح

المقالة الثامنة فى السموم و الهوام

المقالة التاسعة فى الامراض الحادثة من القرن الى القدم

Primus. De Introductione ad Medicinam et de figurâ membrorum eorumque conditione.

Sec. De doctrinâ temperamentorum & corporum eorumque formâ atque de humoribus qui in iis prævalent et de indicationibus ex Physiognomia desumtae (*sic*) [desumtis]. G. R.

Tert. De facultatibus viribusve alimenterum et remediorum.

Quart. De conservandâ valetudine.

Quint. De cultu, ornatu, vel decoro.

Sext. De regimine et medicatione iter facientium.

[Simply, 'Plans for Travellers'.] G. R.

Sept. Summæ et collectanea de arte religandorum ossium fractorum et de vulneribus ac ulceribus.

Oct. De venenis & veneficis & de reptilibus noxis.

[Simply, Of poisons and reptiles.] G. R.

Non. De morbis qui accidunt a vertice ad pedem.

المقالة العاشرة في الحميات و ما يتبع ذلك
بما يحتاج الى معرفته في تجديد علاجها

Dec. De febribus [and their sequelæ] G. R., et de iis quæ ad illas pertinent cognitionibus, quæque haberi debent cum renovatur febrium medicatio.

99. مقالة اضافها الى كتاب المنصوري وهي في
الامور الطبيعية

98 a. Tractatus quem ad librum El-Mansūrī adjecit, estque de rebus naturalibus.

100. الجامع و يسمى حاصر صناعة الطب و غرضه
في هذا الكتاب جمع ما وقع اليه و ادركه
من كتاب طب قديم او محدث الى موضع
واحد في كل باب و هو ينقسم اثني عشر
قسماً —

99. Liber Collectionis et appellatur Artem medicam concludens. Mens ejus in eo est colligere in eodem loco et in singula capita digerere quod sibi evenierit et quidquid librorum Medicinæ sive a veteribus sive a recentioribus conscriptorum consecutus fuerit. Liber est divisus in duodecim partes.

القسم الأول في حفظ الصحة و علاج الامراض
و الوثي و الجبر و العلاجات —

1 a. De tuendâ valetudine et curatione morborum et dolorum, et de arte religandi ossa fracta atque de eorum medicatione.

القسم الثاني في قوى الاغذية فيه ذكر ما
يحتاج اليه من التدابير في الطب

2 a. De facultatibus alimentorum et remedium et de regimine quo indiget ars medica.

القسم الثالث في الادوية المركبة فيه ذكر ما
يحتاج اليه منها على مسيل الاقرباديين —

3 a. De medicamentis compositis in eâ recenset quidquid ex iis opus est per modum Antidotorum.

القسم الرابع فيما يحتاج اليه من الطب في
سحق الادوية و احراقها و تصعيداتها و غلها و
استخراج قواها و حفظها و مقدار بقاء قوّة كل
دواء منها و ما اشبه ذلك —

4 a. De iis quibus opus est in medicinâ ad remedia conterenda, comburenda, sublimanda et lavanda : et ad extrahendas stillatitiâ expressione vires facultatesve eorum ad illa conservanda et ad cognoscendum quam diu durent vires cujusque medicamenti et alia ejusmodi.

القسم الخامس في صيدلة الطب فيه صفة
الادوية و الوانها و طعومها و روائحها و معادنها
و جسيدها و رديها و نحو ذلك من علل
الصيدلة —

5 a. De arte Herbariâ in Medicinâ, in eâ habetur descriptio medicamentorum eorumque colorum gustuum et odorum et nomina locorum quæ illis sunt propria et quæ ex medicamentis sint optima quæ pessima et similia.

القسم السادس في الابدان يذكر فيه ما
ينوب عن كل دواء او غذاء اذا لم يوجد —

6 a. De succedaneis, in illâ memorat ea quæ vicem cujusque vel remedii vel alimenti cum id non reperitur supplere possint.

IBN ABĪ 'UṢAIBI'A.

القسم السابع في تفسير الاسماء و الاوزان
و المكايل التي للعقاقير و تسمية الاعضاء الادواء
باليونانية و السريانية و الفارسية و الهندية و
العربية على سبيل الكتب المسماة شقشماهي (sic) —

[The word شقشماهي is apparently Syriac
= 'pedigree of names' (D. S. Margoliouth).] G. R.

القسم الثامن في التشريح و منافع الاعضاء

القسم التاسع في الاسباب الطبيعية من
صناعة الطب غرضه فيه ان يبين اسباب العجل
بالامر الطبيعى

القسم العاشر في المدخل الى صناعة الطب
و هو مقالتان الاولى منها في الاشياء الطبيعية
و الثانية في اوائل الطب —

القسم الحادى عشر جمل علاجات و صفات
و غير ذلك

القسم الثانى عشر فيما استدركه من كتب
جالينوس ولم يذكرها حنين و لا هي في فهرست
جالينوس

[Here follows a comment by Ibn Abī
'Uṣaibi'a.] G. R.

(اقول) هذا التقسيم المذكور ههنا ليس هو
الكتابه المعروف بالحاوى ولا هو تقسيم مرض
و يمكن ان هذه كانت مسودات كتب
وجدت للراى بعد موته و هي مجموعة على هذا
الترتيب فحسبت انها كتاب واحد و الى غايته
هذه ما رأيت نسخة لهذا الكتاب ولا وجدت
من اخبر انه رأى —

[This may perhaps be the work No. 43
in Brockelmann's list. *Majmū'a fi'ṭṭibb.*]
G. R.

¹ [Ibn Abī 'Uṣaibi'a died A.H. 668 (A. D.
1269).] G. R.

SALOMON NEGRI.

7 a. De interpretatione nominum
quæ ad aromaticas radices et earum
pondus et mensuram pertinent, et de
Nomenclaturâ membrorum et reme-
diorum Græcè, Syriacè, Persicè, Indicè,
et Arabicè [after the manner of the
books called *Shaqshamāhī*]. G. R.

8 a. De Dissectione Anatomicâ et
de utilitatibus Medicinæ. [Uses of the
limbs.] G. R.

9 a. De causis naturalibus in arte
medicâ. Scopus ejus in eâ est ostendere
morborum causas esse res natura-
les.

10 a. Est Isagoge ad artem medi-
cam; duabus constat dissertationibus
altera de rebus naturalibus altera de
principiis sive primordiis Medicinæ.

11 a. Est collectio vel summa cura-
tionum et præscriptionum et alia ejus-
modi.

12 a. De libris Galeni quos ipse
consecutus est et de quibus mentionem
non fecit Honein bin Isaac nec in
Galenī indice reperiuntur.

[Abu Zaid Ḥunain bin Ishāq, the
physician, was the son of a Christian
apothecary at Hira. Apupil of Yahyā b.
Māsawih, he was personal physician
to the Caliph al-Mutawakkil (A.D.
847-561). Among other works trans-
lated Galen and Dioscorides. He died
A.D. 873 of poison self-administered,
in grief at his excommunication by
Theodosius.] G. R.

Ego autem dico partitionem hanc
nullatenus pertinere ad librum ipsius
qui 'complectens' dicitur neque ad
illum quem Mansuro dicavit (this is
S. N. translation, but the work dedi-
cated to Mansūr was called Mansūrī,
whereas this reference is to a different
work] neque illam satisfacere: fierique
posse has partes archetypo variorum
librorum qui apud Errazium post ipsius
obitum fuerint, et ut erant hoc ordine
collecti pro uno libro fuisse habitas:
nam usque ad hunc diem¹ et meam
hanc ætatem non vidi descriptionem
hujus libri, nec quempiam inveni qui
illam à se visam esse nunciaverit.

IBN ABĪ 'UṢAIBI'A.

101. الفاخر في الطب اقول انما اثبت هذا الكتاب في جملة كتبه لكونه قد نسب اليه واشتهر انه له و بالجملة فانه كتاب جيد قد استوعب فيه مؤلفه ذكر الامراض و مداواتها و اختيار معالجاتها على اتم ما يكون و افضلها و جمهور ما فيه منقول من كتاب التقسيم و التشجير للرازي و من كناش ابن سراييون و كل ما فيه من كلام الرازي فأولاه قال محمد و لامين الدولة بن التلميد حاشية على هذا الكتاب و انه للرازي قال الذي كثيرا ما يذكره للرازي في كتاب الفاخر قال محمد هو المعروف بالحسن طبيب المقتدر كان طبيباً ببغداد ماهرا في علم الطب و كان بيته بيت الطب و كان له ثلاث اخوة اقدمهم كحال حاذق يعرف بسليمان و آخر طبيب ليس في رتبته يعرف بهارون و الثالث صيدلاني كبير الصيت ببغداد في الحرفة و له كناش عجيب في تجاريمه لكنه قليل الوجود الا ببغداد المحروسة —

[For an account of Amīnu-d-daulat ibn at-Tilmīz, see *Ibn Abī 'Uṣaibi'a*, i. 259.]

SALOMON NEGRI.

100. Liber de Præstantiâ et Decore Medicinæ [says Ibn Abī 'Uṣaibi'a]:—

Dico librum hunc quia ipsi fuit attributus, ad illum pertinere pervagatum est et inter cæteros ipsius libros esse assertum. Uno verbo librum esse optimum et ejus authorem in eo universam morborum commemorationem, medicationem eorum et modum seligendi curationes scitè et copiosè indidisse: quia et majorem præstantioremque partem eorum quæ in eò habentur, e libro exocismorum (*sic*) et incantamentorum [I believe this to be a mistranslation and that the work referred to is 'book of divisions and branches', see No. 51. G. R.] Errazii et e syntagmate Ebn Serapion esse translata. Quicquid autem in eo refertur tanquam ab Errazi (*sic*) dictum sic incipere 'Dixit Muhammad': et exstare notas sive marginales glossas in hunc librum ab Amineddaulat bin Ettalimid concinnatas in quibus illum progeniuo Errazii opere agnoscit. [S. N. ends this here, but it goes on as follows:—An authority who has written much about Rhazes says with reference to the Kitābul-Fākhīr that the words 'Mohammad said' refer to Al-Hasan the physician to Al-Muqtadir, who was a physician at Baghdād very learned in medical science, and his house was a house of medicine (? private hospital or a medical school). He had three brothers; one a clever oculist of the name of Suleiman, another was a physician of less repute named Hārūn, while the third was a herbalist of great fame in his profession in Baghdād. He wrote a wonderful book *Kunnāsh* (كناش) on his experiences, which, however, is very scarce except in Baghdād.] Kunnāsh = 'collections'—'pandects'.] G. R.

102. في العلة التي لها صار متى انقطع من البدن شئ حتى يتبرأ منه انه لا يلتصق به و ان كان صغيرا و يلصق به من الجراحات العظيمة القدر غير المتبرئة ما هو اعظم من ذلك كثيرا —

101. Liber de causâ cur reflecta de corpore particula ita ut ab illo sejun-gatur eidem non adhærent (*sic*) quantumvis sit parva, & in vulneribus maximis, illæ partes quæ sejunctæ non fuerint adhæreant corpori licet sint multò majores.

IBN ABĪ 'UṢAIBI'A.

103. رسالة في الماء المبرد على الثلج و المبرد
من غير ان يطرح فيه الثلج و الذى يغلى ثم
يمر في الجليد و الثلج --
104. كتاب في العلة التى لها صار السمك الطرى
معطشا --
105. رسالة في انه لا يوجد شراب غير مُسكر يفي
بجميع افعال الشراب المسكر المحمود في
البدن --
106. كتاب في علامات اقبال الدولة
107. كتاب في فضل العين على سائر الحواس
108. رسالة في ان غروب الشمس و سائر الكو
كب عنا وطلوعها علينا ليس من اجل حركة
الارض بل من حركة الفلك
109. كتاب في المنطق يذكر فيه جميع ما يحتاج
اليه منه بالفاظ متكلمى الاسلام
110. كتاب في فسح ظن من يتوهم ان الكواكب
ليست في نهاية الاستدارة و غير ذلك
111. كتاب في انه لا يتصور لمن لادرية له بالبرهان
ان الارض كرية و ان الناس حولها
112. رسالة يبحث فيها عن الارض الطبيعية
طين هي ام حجر داخل سمع الكيان
113. كتاب يوضح فيه ان التركيب نوعان و
غير ذلك
- 113 a. مقالة في العادة و انها تكون طبيعية
114. مقالة في المنفعة في اطراف الاجفان دائماً
115. مقالة في العلة التى من اجلها تضيق
النواظر في النور و تتسع في الظلمة
116. مقالة في العلة التى لها تزعم الجهال ان
لشلج يعطش

SALOMON NEGRI.

102. Epistola de Aquâ nive refrige-
ratâ & de illâ quæ non injectâ nive,
atq; de eâ quæ ebullitur et postea gelu
& nive refrigeratur.

103. Liber de causâ propter quam
fit ut piscis recens sitim excitet.

104. Epistola. Quod non reperiatur
vinum non inebrians: in eâ observat
omnes effectus vini inebriantis et cor-
pori convenientis.

105. Liber. De indiciis felicitatis
Imperii.

106. Liber. De præstantiâ oculi
seu visus super ceteros sensus.

107. Epistola. Quòd occasus Solis
et ceterorum Planetarum ut et eorum
ortus non sit ob motum terræ sed fiat
per motum orbis cælestis.

108. Liber de Logicâ, in eo refert
quidquid ex eo scitu necessarium est,
idque locutionibus Metaphysicorum
Muslimorum.

109. Liber de evertendâ opinione
eorum qui putant Planetas non esse in
extremâ circumitione et de aliis ad id
argumentum pertinentibus.

110. Liber. Quòd illi qui ignorant
demonstrationem terram esse sphæri-
cam hominesq; circum illam non pos-
sint animo recipere illius formam.

111. Epistola. In quâ disquirat de
terrâ naturali an sit lutum an lapis.
[Included in the *Sama'ul Kiyân*.] G. R.

112. Liber in quo declarat compo-
sitionem [corporum] duobus fieri modis
et alia ejusmodi.

113. Lib. De consuetudine sive
habitu quod sit naturalis.
[Of habit, which becomes natural.]
G. R.

114. Dissertatio. De utilitate in
extremitate palpebrarum perpetuâ. [?]

115. Dissertatio. De causâ ob
quam oculi coarctentur in luce et
dilatentur in tenebris.

116. Dissertatio. De causâ propter
quam existiment imperiti sitim nive
excitari.

IBN ABĪ 'UṢAIBI'A.

SALOMON NEGRI.

117. مقالة في العلة التي لها يحرق الشالج و يقرح
117. Dissertatio. De causâ propter quam nix urat et lætificet.
[Evidently S. N. read يُقَرِّحُ, but it is more likely that we should read يُقَرِّحُ 'pustulates' or 'blisters' here.] G. R.
118. كتاب اطعمة المرضى
118. Liber. De alimentis ægrotantium.
119. مقالة فيما استدركه من الفصل في الكلام في القائلين بحدوث الاجسام و على القائلين بقدّمها
119. Dissertatio in quâ dirimit controversiam tum eorum qui corpora in tempore esse condita et eorum qui ab æterno fuisse dicunt.
[Supplementary remarks to the chapter dealing with those who assert that bodies were brought into existence from non-existence, and opposing those who affirm that they were from everlasting.] (Margoliouth.) G. R.
120. كتاب في ان العلل اليسيرة بعضها اعسر تعرفًا و علاجًا و غير ذلك
120. Liber. Quòd morbi quidam exigui difficiliores sint cognitu et curatu, &c.
121. كتاب العلة التي لها تدم العوام الاطباء للذاق
121. Liber. De causâ propter quam vulgus acutissimos quoque Medicos vituperet.
122. رسالة في العلل المشكلة و عذر الطبيب و غير ذلك
122. Epistola. De morbis difficilibus ac obscuris et de medici excusatione.
123. رسالة في العلل القاتلة لعظامها و القاتلة لظهور بغتة مما لا يقدر الطبيب على صلاحها و عذره في ذلك
123. Epistola. De morbis interimmentibus ob maximam illorum vehementiam, et de iis quæ de repente in ipso eorum ortu accidunt quæ medicus corrigere non potest et de ipsius excusatione in talibus.
124. كتاب في ان الطبيب للذاق ليس هو من قدر على ابراء جميع العلل فان ذلك ليس في الوسع و لا في صناعة ابقرات وانه قد يستحق ان يشكر الطبيب و يمدح و ان تعظم صناعة الطب و تشرف و ان هو لم يقدر على ذلك بعد ان يكون متقدما لأهل بادء وعصره
124. Liber. Quòd medicus acutus non sit ille qui possit omnes curare morbos quoniam hoc non est in hominum potestate nec penes Hippocratis artem. Nihilominus tamen dignus cui gratiæ referantur et qui laudetur medicus et digna quæ magni fiat ac in pretio habeatur ars medica etiam si ipse non possit illud præstare, modo inter populares et æquales suos præcellat.
125. رسالة في ان الصانع المتعرف بصناعة معدوم في جل الصناعات لا في الطب خاصة و لعة التي من اجابها صاد ينسجج جهال الاطباء و العوام و النساء في المدن في علاج بعض الأمراض الشر من العلماء و عذر الطبيب في ذلك
125. Epistola. Quod artifex omnibus numeris absolutus in quâcunque arte non exstat nedom in Medicinâ speciatim: et de causâ cur imperiti medici, vulgus et etiam mulieres in civitatibus foeliciores sint in sanandis quibusdam morbis quam viri doctissimi et de excusatione medici hoc propter.

IBN ABĪ 'UṢĀIBI'A.

SALOMON NEGRI.

126. كتاب الممتحن في الطب على سبيل
كناش 126. Liber. De Probatis et experientia compertis in arte medicâ : per modum syntagmatis est digestus.
127. كتاب في ان النفس ليست بجسم . 127. Liber. Quod anima non sit materialis et corporea.
128. كتاب في الكواكب السبعة في الحكمة 128. Liber. De septem Planetis et de Sapientia.
129. رسالة الى الحسن بن سقى بن محارب القى 129. Epistola ad El-Hassan bin Isaac bin Moharib El-Kamahî. [El-Qummî.] G. R.
130. كتاب في النفس المغيرة (sic) 130. Liber de animo tenaci ac parco. [The small book on the soul.] G. R.
- [Read كتاب في النفس صغير G. R.]
131. كتاب في النفس الكبير (sic) 131. Liber. De animo magno. [The large book on the soul.] G. R.
- [Read الكبير for كبير G. R.]
132. مقالة في العلة التي من اجلها يعرض الزكام 132. Dissertatio. De causâ ob quam accidit Coryza sive tenuis per nares distillatio Abi Zaido Balkhensi¹ in tempestate veris cum rosas olfacit.
- لابى زيد البلخى في فصل الربيع عند شمة الورد¹ See note ante, p. 238.
133. رسالة في محنة الطبيب وكيف ينبغي ان يكون حاله في نفسه و بدنه و سيرته و آدابه 133. Epistola. De probatione medici et quomodo eum esse deceat quantum ad animum et ad corpus et de ejus vitâ conversatione et moribus.
134. رسالة في مقدار ما يمكن ان يستدرك من احكام النجوم على راي الفالسة الطبيعين و من لم يقل منهم ان الكواكب احياء و ما يمكن ان يستدرك على راي من قال انها احياء — 134. Epistola. De doctrinâ stellarum et quantum quis potest cognitione assequi in stellarum scientiis juxta sententiam Philosophorum naturalium et eorum inter eos qui negant astra frui vitâ, et quod etiam potest intelligi juxta opinionem eorum qui eadem viventia esse asserunt.
135. كتاب في العلة التي لها صار يحدث النوم في رؤوس بعض الناس شبيها بالزكام 135. Liber. De Causâ propter quam somnus oriri facit in quorundam capitibus aliquid simile Coryzae.
136. كتاب في الشكوك التي على برقلس (sic) 136. Lib. De dubiis quæ habentur de Barcleo [an Pericli] (sic). [Proclus.] G. R. (M.)
137. كتاب في تفسير كتاب افلوطرخس لكتاب طيماس 137. Liber. De explicatione libri Plutarchi seu commentarii in librum Timai. [Timæi.] G. R.
138. رسالة في علة خلق السباع و الهوام 138. Epistola. De causâ creationis ferarum et reptilium noxiorum.
139. كتاب في اتمام ما ناقص به القائلين بالهولي 139. Liber. Supplementum ad ea quibus contradixerat sententiis eorum qui materiam primam oppugnaverant.

IBN ABĪ 'UṢAIBI'A.

140. كتاب فى ان المناقضة التى بين اهل
الدهر و اهل التوحيد فى سبب احداث العالم
انما جاز من نقصان السمّة فى اسباب الفعل
بعضه على التهادية و بعضه على القائلين بقدم
العالم —

141. كتاب فى نقضه على بن شهيد البخى
فيما ناضه به فى الامر اللذة —

142. كتاب فى الرياضة

143. كتاب فى النقض على الكيال فى الامامة

144. كتاب فى انه لا يجوز ان يكون سكون و
افتراق

145. كتاب فى اتمام كتاب افلوطرخس

146. كتاب فى نقض كتاب التدبير

147. اختصار كتاب حيلة البرء جالينوس

148. اختصار كتاب النبض الكبير جالينوس

149. تلخيص كتاب العلل و الاعراض جالينوس

150. تلخيص كتاب الاعضاء الآلة جالينوس

151. كتاب الانتقاد على اهل الاعتزال

There is no work corresponding to this
in the Arabic list of works. See 152. G. R.

152. كتاب فى نقض كتاب البلخى لكتاب العلم
الالهى و الرد عليه

153. كتاب فى انه يجوز ان يكون سكون و
اجتماع ولا يجوز ان يكون حركة و اجتماع
لم يزل

SALOMON NEGRI.

140. Liber de causâ contradictionis
eorum qui seculares seu Aionii (*sic*) di-
cuntur et æternitatem mundi defendunt
et eorum qui mundi novitatem tutantur.

[140. Book showing that the dispute
which arose between the Atheists and
the Monotheists as to the cause of the
origin of the world was only possible
by reason of insufficiently distinguishing
the causes of action. Part of the book
being directed against the تمادية and
part against those who affirm that the
world is from everlasting.]

I am indebted for this note to Professor
Margoliouth, who thinks that the pas-
sage is corrupt as regards the words
تمادية and سمّة. G. R.

141. Liber. De confutandâ sen-
tentiâ Ali ben Shahid Balkhensis
qui ipsi contradixerat in quæstione de
voluptate.

142. Liber. De diebus exercitii.

143. Liber. De defectu mensuræ
in dignitate Antistitum Religionis.

144. Quod non detur quies et sepa-
ratio simul.

145. Liber. Supplementum libris
Plutarchi.

146. Liber. De confutando libro
'De regimine et De Diaita'.

147. Compendium libri Galeni de
technis adhibendis ad sanandum.

148. Compendium libri majoris Ga-
leni 'De pulsu'.

149. Expositio libri Galeni de morbis
et accidentibus.

150. Expositio libri 'De morbis
dolorem incutientibus' (of Galen).

151. Liber. De discretione opinio-
num adversus sectam Motazileh sive
Schismaticorum.

152. Liber. De confutatione libri à
Balkho scripti.

153. Lib. Confutatio libri Balkhen-
sis 'De Metaphysicâ' et ad ipsum res-
ponsio.

154. Liber. Quod detur existentia et
continuatio et non detur esse motum et
continuationem qui non desinant.

IBN ABĪ 'UṢAIBI'A.

154. رسالة في ان قطر المربع لا يشارك الضلع
من غير هندسة

155. كتاب في الاشفاق على اهل التحصيل من
المتكلمين بالفلسفة و غرضه يبين مذهب
الفلاسفة في العلم الالهى لمنع القارى بذلك
عن المتحرك اليهم —

156. كتاب في السيرة الفاضلة و سيرة اهل المدينة
الفاضلة

157. كتاب في وجوب الدعا و الدعاوى

158. كتاب الحاصل و غرضه فيه ما يحصل من
العلم الالهى من طريق الاخذ بالحرص و طريق
البرهان

159. رسالة لطيفة في العلم الالهى

160. كتاب منافع الاغذية و دفع مضارها و هو
مقالتان يذكر في الاولى منهما ما يدفع به ضرر
الاطعمة في كل وقت و مزاج و حال و في
الثانية قولان استعمال الاغذية و دفع التخم (sic)
و مضارها الفه للامير ابى العباس احمد بن على

161. كتاب الى على بن شهيد البلخى في تثبيت
المعاد خروسة فيه النقض على من ابطال المعاد
و يثبت ان معادا —

162. كتاب عللة جذب حجر المغنيطيس للديد
و فيه كلام كثير في الخلاء —

163. كتاب كمير في النفس

SALOMON NEGRI.

155. De Quadrato in Mathesi Epistola.
[Pamphlet to prove that the diameter
of the square is not commensurate with
the side, without Geometry.] G. R. (M.)

156. De Dissidiis et sententiis Philo-
sophicorum (sic) Metaphysicorum.

[156. Book of commiseration with
the accomplished philosophers, its
purpose being to explain the views of
philosophers on Theology in order to
keep those who read it from taking
action against them.] G. R. (M.)

157. Liber. De optimo vivendi ge-
nere et de morum urbanitate.

158. Liber. De necessitate preca-
tionis.

159. Liber. Summa Metaphysicæ.
[Should be here Liber de acqui-
rendâ Metaphysicæ notitiâ per de-
monstrationem, which S. N. gives as
a separate work.] G. R.

[159. The book called *al-Hāṣil*.
Its object being that which is obtained
in the way of Theology by the path of
following impulse and the path of de-
monstration.] G. R. (M.)

160. Epistola. De Metaphysicâ
elegantissime.

161. Liber. De utilitatibus alimen-
torum et de repellendis ipsorum noxis,
in duos tractatus: in primo recenset
ea quæ ciborum noxam expellunt et
indigestionem ac gravationem amovent
omni tempore in omni temperamento et
in omni statu. Composuit illam gratiâ
Principis Abi-I-Abbās Aḥmad b. Ali.

[See *Kitābu-l-Vuzarā*, p. 455.] G. R.
(M.)

162. Liber. [To Ali b. Shahīd al-
Balkhī] de apertione alterius vitæ,
scopus ejus in illo est evertere senten-
tiam eorum qui alteram vitam faciunt
irritam, probareque esse alteram vitam
et extremi judicii diem.

[These last words (in italics) are not
in the Arabic.] G. R.

163. Liber. De causâ curlapis Magnes
ferrum attrahat, et in eo habetur multa
oratio de vacuo.

164. Liber major de Animâ.

IBN ABĪ 'UṢAIBĪ'A.

164. كتاب صغير في النفس
 165. كتاب ميزان العقل
 166. كتاب في الشراب المسكر و هو مقالتان
 167. مقالة في السكنجبين و منافع و مضاره
 168. كتاب في القولنج
 169. مقالة في القولنج الحار و هو المعروف بكتاب القولنج الصغير
 170. كتاب في تفسير كتاب جالينوس لفصول ابقراط
 171. كتاب في الأئنة و علاجها و تبينها
 172. كتاب في نقض كتاب الوجود لمنصور بن طلحة
 173. كتاب في ما يروى من اظهار ما يدعى من عيوب الاولياء (اقول) و هذا الكتاب ان كان قد ألف و الله أعلم فربما ان بعض الاشار المعادين للرازي قد ألفه و نسبة اليه — ليس ممن يرى ذلك الكتاب او يسمع به الظن بالرازي و الا فالرازي اجل من ان يحاول هذا الامر و ان يصنف في هذا المعنى و حتى ان بعض من يذم الرازي بل يكفره كعلی بن رضوان المصرى و غيره يسمون ذلك الكتاب كتاب الرازي في مخاريق الانبياء

SALOMON NEGRI.

165. Liber minor de Animâ.
 166. Liber. Trutina intellectus.
 167. Liber de potu inebriante in duos tractatus.
 168. Tractatus de Oxymele et ejus utilitatibus et noxis.
 169. Liber. De dolore Colico.
 170. [Omitted by S. N. A treatise on Inflammatory Colic known as *Kitābu-l-Qulinju-s-Saghīr* (The small book on Colic).] G. R.
 171. Liber. De explicatione libri Galeni de Aphorismis Hippocratis.
 172. Liber. De pruritu *doloreve qui oritur in anu eorum qui cinædorum more corpus suum præstiluunt (sic)* et de curando atque indicando.
 [The words in italics are not represented in the Arabic.] G. R.
 173. Lib. Confutatio libri de existentia a Mansuro ben Talha scripti.
 [See *Fihrist*, p. 117.] G. R. (M.)
 174. Lib. De iis quæ vellet manifestare et esse contendit vitiis quæ Prophetis et viris sanctis attribuuntur. N.B. ego dico librum hunc si unquam fuerit compositus (Deus enim novit) ab aliquo forte sceleratorum Errazii inimicorum fuisse compositum illique attributum. Nemo enim vidit illum librum aut de eo audivit quin male de Errazi sentiret. Sed tantum abest ut Errazi vir eximius et spectatus probitatis voluerit talibus se immiscere aut in ejusmodi sensu quidquam scribere. Verum quidam ex inimicis ejus ut Ali bin Radhwān Ægyptius Errazium vituperarunt immò et impietatis eum accusarunt et librum hunc ita inscribunt Errazii de flagellis prophetarum.
 [From 'Ego dico' the words are the expression of opinion of Ibn Abī 'Uṣaibī'a.] G. R.
 [For an account of 'Alī b. Rīzwān, see *Ibn Abī 'Uṣaibī'a*, i. 241.] G. R. (M.)
 175. Lib. De virtutibus Antistitis præstantissimi El-Massum.
 [Al-Ma'sūm = The Infallible. The promised Mahdī.] G. R. (M.)

174. كتاب في اثار الامام الفاضل المعصوم

IBN ABĪ 'UṢĀIBI'A.

175. كتاب فى استفراغ المحمومين قبل النضج
 176. كتاب الامام و المأموم المحقين
 177. كتاب خواص التلاميذ
 178. كتاب شروط النظر
 179. كتاب الآراء الطبيعية
 180. كتاب خطأ غرضى الطبيب
 181. اشعار فى العلم الالهى
 182. صفة مداد معجون لا نظير له
 183. نقل كتاب الأس لجابر الى الشعر
 184. رسالة فى التركيب
 185. رسالة فى كيفية النحو
 186. رسالة فى العطش و ازدياد الحرارة لذلك
 187. كتاب فى جمال الموسيقى
 188. كتاب فى الاوهام و الحركات النفسانية
 189. كتاب فى العمل بالحديد و الجبر
 190. كتاب فى ما يعتقد رآيا
 191. كتاب فيما اغفلته الفلاسفة
 192. كتاب السرى للحكمة
 193. كتاب فى منافع الاعضاء
 194. كتاب الكافى فى الطب
 195. كتاب فى المتنقل

SALOMON NEGRI.

176. Liber. De vomitione febricitantium ante maturitatem.
 177. Liber de Antistitibus veris.
 178. Liber de dotibus discipuli.
 179. Lib. De Speculationis conditionibus.
 [On the conditions of vision.] G. R.
 180. Lib. De opinionibus circa res naturales.
 181. Liber de errore medici et scopum non attingat.
 182. Carmina de Scientiâ Metaphysicâ.
 183. Præscriptum Electuarii cujusdam præstantissimi.
 [Description of an incomparable ink.] G. R. (M.)
 184. Interpretatio libri Philosophi Giaber de Arcanis metricis.
 [Jābir b. Haiyyān, ob. A.D. 776. The European 'Geber'.] G. R.
 185. Epistola. De Compositione.
 186. Epistola. De Grammaticâ.
 187. Epistola. De siti et ob eam caloris augmento.
 [Of thirst, and its increase by heat.] G. R.
 188. Liber. De summâ Musices.
 189. Liber. De imaginationibus et animi motibus.
 190. Liber. De usu ferri [i.e. operative treatment] G. R. et de ossium fractorum religatione.
 191. Liber. De iis quæ opinione creduntur.
 192. Liber. De iis quæ prætermissa sunt Philosophis.
 193. Liber Arcani in Sapientiâ.
 194. Liber. De utilitatibus membrorum.
 195. Liber Sufficiens in Medicinâ.
 195 a. Book of the eater of dessert fruit.
 [Omitted by S. N.] G. R.

IBN ABĪ 'UṢĀIBI'A.

196. كتاب الاقربادين المختصر
197. كتاب في البرء يوضح فيه ان التركيب نوعان
اما تركيب اجسام مختلفة و اما تركيب الاجسام
المشتبهة الاجزاء و انه ليس واحد على الحقيقة
الاخرى
198. كتاب الى ابي القاسم بن دلف في الحكمة
199. كتاب الى على بن وهبان فيه باب واحد
في الشمس
200. كتاب الى ابن ابي الساج (؟) في الحكمة
201. كتاب الى الداعي الاطروش في الحكمة
202. كتاب سر الاسرار في الحكمة
203. كتاب سر الطب
204. كتاب في شرف الفصد عند الاستفراغات
الامتلايئة رداة و كمية و فضله على سائر
لاستفراغات و الابانة على ان الفصد لا يمنع
عند الاحتياج اليه شئ البتة — الفه للامير ابي
على احمد بن اسمعيل بن احمد
205. كتاب المرشد و يسمى كتاب الفصول
206. رسالة في ان العلل المستكملة التي لا يقدر
الاعلاء ان يعبروا عنها و يحتاج الطبيب الى
لزوم العليل و الى استعمال بعض التجربة لاستختر
اجها و الوقوف عليها و تحيّر الطبيب —
207. كتاب مختصر في اللبن

SALOMON NEGRI.

196. Liber Compendiosus Antidotorum.
- 196 a. [No number in the MS.] Liber de Sanatione in eo declarat compositionem esse duplicem; alteram esse compositionem corporum diversis, alteram corporum similibus constantium partibus, nec revera unam esse alteram.
197. Liber. De Sapientiā ad Abi'l Kassim ben Dulf (*sic*).
[Abu'l Qāsim b. Dulaf.] G. R.
198. Liber ad Ali ben Wabhān, in eo solum habetur caput de sole.
[See *Kitābu-l-Vuzarā*, Index.] G. R. (M.)
199. Liber. De Sapientiā ad Ebn Ali Essanayī.
[Ibn Abi-s-Sāj, see *Kitābu-l-Vuzarā*, Index.] G. R. (M.)
200. Liber alius De Sapientiā [To the Dā'ī al-Utrūsh (Ḥasan b. 'Alī al-'Alavī) who converted the Dailamites from Magianism to Islām A.D. 914]. G. R.
201. Liber. Arcanum arcanorum de Sapientiā.
202. Liber. Arcanum Medicinæ.
203. Liber. De præstantiā Phlebotomiæ. [In cases of vomiting from surfeit, severe and trivial, and its superiority over other kinds of vomiting. G. R.] In eo demonstrat quòd urgente necessitate nullā re impediri debere sectionem venæ. Scripsit illum gratiā Principis Abi Ali Ahmad ben Isma'īl [b. Aḥmad].
204. Liber directionis et vocatur Liber sectionum.
205. Liber. Quòd in *morbis* [progressing diseases, G. R.] qui determinari atque explicari non possunt, oporteat ut medicus sit assiduus apud ægrotantem et debeat uti experimentis ad illos cognoscendos. Et de medici fluctuatione.
206. Liber Compendiosus de lacte.

IBN ABI 'UṢAIBI'A.

208. كلام جرى بينه وبين المسعودى فى حدوث
العالم
209. كتاب المدخل الى الطب
210. مقالة فى المذاقات
211. مقالة فى البهق و البرص
212. كتاب زينة الكتّاب
213. كتاب برء الساعة الفه للوزير ابى القاسم بن
عبد الله
214. مقالة فى البواسير و الشقاق فى المقعدة
215. كلام فى الفروق بين الامراض
216. مقالة فى الحرقه الكائنة فى الاحليل و المثانة
217. كتاب طب الفقراء
218. رسالة الى الوزير ابى الحسن على بن عيسى
بن داؤود بن الجراح القناتى فى الاعلال
للحادثة على ظاهر الجسد
219. رسالة الى تلميذه يوسف بن يعقوب فى
ادوية العين و علاجها و مداواتها و تركيب
الادوية لما يحتاج اليه من ذلك
220. كتاب صيدلة الطب
221. كتاب فى جواهر الاجسام
222. كتاب فى سيرته

SALOMON NEGRI.

207. Sermones circumlati ipsum
inter et Massudum [Mas'ūdī]¹ de novi-
tate mundi.
[¹ Abu'l Ḥasan 'Alī, *ob.* 956 A.D.]
208. Liber. Isagoge ad Medicinam.
209. Tractatus de gustibus.
210. Tractus (*sic*) de Leuce seu
Vitiligine et Lepra.
[On Vitiligo and Leprosy (true).]
G. R.
211. Liber de Ornatu et Decoro.
[The ornament of scribes.] G. R.
- 211 a. Book on cure of disease in an
hour. Composed for the Vizīr Abu'l
Qāsim b. 'Abdullah. [See Bodl. Pers.
I. 929; Marsh 42. Urii Pers. xcii (6).]
See Kitābu-l-Vuzarā, Index. G. R.
N.B. Omitted by Salomon Negri.
212. Tractatus de hæmorrhoidē et
fissuris in podice.
213. Sermo de divisione et dis-
tinctione morborum.
214. Tractatus de exustione in peni
et vesicā existente.
215. Liber. Medicina pauperum.
[See *ante*, No. 47.] G. R.
216. Epistola ad Wezirum Abi'l
Ḥasan 'Alī bin Isā b. Dā'ūd b. al-
Jarrāḥ al Qanā'ī de morbis qui corpori
extrinsecus accidunt. [See *Kitābu-l-
Vuzarā*, Index.] G. R. (M.)
217. Epistola ad suum discipulum
Iosephum Iacobi filium de remediis
oculi et ejus medicandi ratione tum de
medicamentorum compositione [neces-
sary to that end]. G. R.
- 217 a. Book on Materia Medica.
G. R.
- N.B. Omitted by Salomon Negri.
218. Liber de substantiis corporum.
219. Liber de ipsius vitā.

IBN ABĪ 'UṢAIBI'A.

223. مقالة فى الزكام و النزلة و امتلاء الرأس
و منع النزلة الى الصدر و الريح التى تسد
المنخرين و منع التنفس بهما

224. مقالة فى ابدال الادوية المستعملة فى الطب
و العلاج و قوانينها و جهة استعمالها

225. كتاب صفات البيمارستان

226. مقالة فى الاغذية مختصرة

227. مقالة فى ما سئل عنه فى انه لم صار من
قل جماعة من الانسان طال عمره فيها الامير
ابى العباس احمد بن على

228. مقالة فى العلة التى لها اذا اكلت الحيوانات
سخت ابدانها ما خلا الانسان فانه يجد عند
اكله فتوراً

229. مقالة فى الكيفيات

230. رسالة فى اللحم و منافعه و مضاره

231. كتاب فى الدواء المسهل و المقضى

232. مقالة فى علاج العين بالحديد

SALOMON NEGRI.

220. Tractatus de Coryzâ fluxione
et repletione capitis, et de cohibitione
fluxionis ut pectus non attingat, et venti
qui nares oberat (*sic*) et halitum per eos
impedit.

221. Tractatus de succedaneis quæ
adhibentur in Medicinâ inter medican-
dum, de illorum regulis et de iis utendi
ratione.

222. Liber. Nosocomii descriptio.

223. Tractatus brevis de victu.

224. Dissertatio de quæstione ipsi
propositâ quamobrem evenit ut ille qui
parum indulget veneri diutius vivat
Composuit illum gratiâ Principis Abi'l
Abbas Ahmad bin Ali. [See No. 161.]
G. R.

225. Dissertatio de causâ cur ani-
malia cum vescuuntur calefiant eorum
corpora, excepto homine, qui cum co-
medit fiat remissior debiliorque.

226. Dissertatio de Qualitatibus.

227. Omitted by Salomon Negri.
Treatise on the Hot Bath, its advan-
tages and disadvantages. G. R.

228. Omitted by Salomon Negri.
Book. On Laxative and Emetic Medi-
cines. G. R.

229. Omitted by Salomon Negri.
Dissertation on the Cure of Eye Dis-
eases by operative treatment. G. R.

The only specimen of Rhazes' poetry which has come down to us is represented by the following verses in the metre known as *Tawîl*, which are quoted by Ibn Abî 'Uṣaibi'a. I have ventured to furnish a translation of them in the form of a quatrain.

لعمري ما ادرى و قد اذن البلى	This feeble form decaying day by day
بعاجل ترحال الى اين ترحالى	Warns me that I must shortly pass away.
و اين محل الروح بعد خروجه	Alas! I know not whither wends the Soul
من الهيكل المنحل و الجسد البالى	When it deserts this worn and wasted clay.

[Friday Afternoon, August 8]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

SORANUS ON GYNÆCOLOGICAL ANATOMY

By A. H. F. BARBOUR, M.D., LL.D., LECTURER ON GYNÆCOLOGY IN
THE UNIVERSITY OF EDINBURGH

IN the Forum at Rome the eye is arrested by the remains of the temple of Castor and Pollux—three Corinthian columns supporting a singularly beautiful entablature. So in the temple of Esculapius, we find the practice of the healing art resting on the three pillars of Anatomy, Physiology, and Pathology. What appealed to me in Soranus, when I first became acquainted with his writings many years ago, was his exact knowledge of pelvic anatomy, and the application of that knowledge to elucidate clinical facts.

The work of the anatomists of the Renaissance and their association with the artists of that period roused the enthusiasm of that distinguished American man of letters and physician, Oliver Wendell Holmes. In *The Guardian Angel* he puts these words into the mouth of one of his characters: 'Look at these woodcuts—the first anatomical pictures ever printed, doctor, unless these others of Jacobus Berengarius are older! . . . Take a look, too, at my Vesalius—not the Leyden edition, doctor, but the one with the grand old original figures—so good that they laid them to Titian. And look here, doctor, I couldn't help getting this great folio, Albinus, 1747—and the nineteenth century can't touch it, doctor—can't touch it for completeness and magnificence—so all the learned professors tell me! Brave old fellows, doctor, and put their lives into their books as you gentlemen don't pretend to do nowadays.'

It is noteworthy that all these names were famous in the anatomy of obstetrics and gynæcology. Berengario gave the first exact description of the uterus, and it is significant that in the *Isagoge breves*,¹ the first

¹ ' *Anatomia Carpi, Isagoge breves perlucide ac uberime, in Anatomiam humani corporis, a communi Medicorum Academia usitatam, a Carpo in Almo Bononiensi Gymnasio Ordinariam Chirurgiæ publicæ Docente, ad suorum Scholasticorum præci in lucem date. Venetiis, Anno D. mccccxxv.*' The title-page is adorned with a vigorous woodcut of Berengario at work among his pupils. On the last page of the book it is described as—' *Impressum Venetiis per Bernardinum de Vitalibus Venetum, MDXXXV.*'

text-book of the Renaissance period with illustrations, the only viscus he considers worthy of reproduction is the uterus.¹

Ex Libris Bibliothecæ
ΡΟΥΦΟΥ ΕΦΕΣΙΟΥ

ἰπρὶ ἡμῶν κῶς καὶ νεφροῖς παθῶν.

Περὶ ἡμῶν φαρμάκων καὶ διαρκῶν.

Περὶ δέσπωσης καὶ ὀνομασίας ἡμῶν τοῦ ἀνθρώπου μερῶν.

ΣΟΡΑΝΟΥ περὶ μήτρας, καὶ γυναικείων αἰσθησέων.

R V F F I E P H E S I I

De vesicæ renūmque morbis.

De purgantibus medicamentis.

De partibus corporis humani.

SORANI de vtero & muliebri pudendo.

EX BIBLIOTHECA REGIA.

Collegii



Regii

Medicor.

Edenburg.

Βασιλεῖ τ' ἀγαθῷ κρατερῶ τ' αἰχμητῇ.

PARISIIS, M. D. LIIII.

Apud Adr. Turnebum typographum Regium.

EX PRIVILEGIO REGIS.

FIG. 1. Title-page of small vellum octavo containing the chapter on anatomy from Soranus.

Berengario's illustration is somewhat rude. It is in the anatomical plates of Vesalius that we find the first accurate drawing of the uterus,

¹ The illustration represents a female figure standing with a veil behind her which she holds over her head with the left hand. The abdomen is laid open: the uterus and cervix divided coronally. There is grim humour in representing the subject as holding in her right hand for purposes of demonstration the front half of her divided uterus and cervix. 'In the fundus of the uterus you will see a certain depression indicating a right and left half; but I have not found in the uterus any other division.' Thus Berengario combats the erroneous teaching of Mondino, the father of modern anatomy, who taught that the uterus contained seven cavities.

ΕΚ ΤΩΝ ΣΟΥΙΔΑ.

Ρῶφος ἐφεστος ἰαῶτες γενοῖς ὅτι Τεχναῖοι ὧν Κεῖ
 τυπὶ φέρεται αὐτῇ βίβλια πλῆτα, ἥ ὡν ἐξωπα Γρῆ διαφ
 πης ἔ. Πρὶ διαφτης πλεόντων α. Πρὶ νυμπακῶν φα
 μάκων α. Πρὶ θραυματικῶν ἄφρων α. Πρὶ σῦκων α.
 Πρὶ ἄρχασις ἰατρικῆς βιβλίων α. Γρὶ γαλκίος βιβλίων
 α. Γρὶ οἴνων βιβλίων α. Γρὶ ῥήτων α.

Σωκράτης Μετάνδρου & Φοίβης, ἐπίσκοπος ἰατρῆς, διὰ τῆς
 ἰατρικῆς ἀλεξάνδρεια, καὶ ἐν πρώμῃ τῇ ἰατρύσας ἐπὶ Τεγία-
 τοῦ καὶ Ἀδριανοῦ τοῦ βασιλέως, βιβλία πέντε
 καὶ κάρτα. Γνωσκίτω βιβλία 8. Βίοι ἰατρῶν καὶ ἀρι-
 στῶν ἐς ἑλντῶματα, βιβλία δέκα, καὶ ὅσα ὁσφορεα.

2

A

ΒΚ ΤΩΝ ΣΩΡΑΝΟΥ ΠΕΡΙ
μήτρας καὶ γυναικείου αἵματος.

Μήτηρ α ὅτι ἔσται λέγεται διὰ το-
φί· μήτηρ γὰρ αὐτοῦ, ὅτι μήτηρ
ὅτι ἦν ἐξ αὐτῆς ἡτοιμασμένη ἐμο-
βρῶν, ἡ ὅτι πατρὶς ἐχούσας αὐτῶν
μήτερας ποιεῖ· καὶ δὲ πινας, ὅτι
μήτερον ὅτι χεῖρας πατρὸς καθαίρει
σιν ἐξ ὑποτίθιν· ὅτι ἔσται δὲ, διὰ τὸ
ἐσθλὴν κείναι ἢ σωτηρίας.

εἰ μὴ πρὸς ἀκρίβειαν, ὅσα κ' ἢ πλάτος· δελεᾶς δέ, διό· τὸ
 ἀδελφάν αὐτῶν (ἦ) ἡνιπικνῆκαί τε δὲ ἐν τῇ ἡβῇ ἰχθύνοντι
 ρυπαρεῖα μεταξὺ κύστεως καὶ ἀπυθυσμένου ἐν πύρου, ἔν τε
 μὲν ὅπκειμένη, τῇ κύστει δὲ ἰσοκείμενη, ποτὲ μὲν ὅλη, ποτὲ δὲ
 ἀπὸ μέρους, διό· τὸ κ' ἢ μέγεθος ὡς ἀμείψασθαι· ταῖς μὲν γὰρ νη-
 πτίαις μικροτέρας τῆς κύστεως, διό· ὅτι ὅλῳ ὅντι ὑπὲρ ἡλ-
 ῖου· ταῖς δὲ ἐν ἀκμῇ παρθένους, ἴση τῇ κύστει κ' ἢ ἰσοκείμε-
 ναί· ταῖς δὲ πρὸς ἡλικίαν, καὶ ὅδ' ἀδιακεκορβυμένας, καὶ
 μάλλον πρὸς κεκορηγίας μύζων· ὥστε ταῖς πλείους ἐν ἡβῇ,
 ἢ κόλου πρὸς ἀπώσεσθαι· μάλλον δὲ ἐν ᾧ κυοφορεῖται, ὡς καὶ
 τῇ ὁρᾷ καταλαμβάνειν ὅτιναι, εἰς πολὺ διοικωμένας ὡς ἀ-
 σπαιούσας, καὶ τὸ ὅππασχίου, καὶ ἐκ τῶν πηλικῶν (ἦ) τὸ ἀπὸ

B

FIG. 2. A, Extract from Suidas on prefatory page of small vellum octavo. B, First page of text of chapter on anatomy in same.

which I shall have occasion to refer to later in speaking of Moschion. To the third name that roused Wendell Holmes's enthusiasm, Albinus,¹ we owe the first adequate and artistic drawings of the uterus in pregnancy.

It was in studying the contributions of these 'brave old fellows' to the anatomy of modern obstetrics and gynæcology, that I came on a little vellum octavo in the library of the College of Physicians, Edinburgh published in Paris in 1554, and containing three monographs of Ruffus Ephesius and one of Soranus. I give the title-page in Fig. 1. One is tempted to ask whether this Ruffus is the writer mentioned by our poet Chaucer in the Prologue to the *Canterbury Tales*.

'With us ther was a Doctour of Phisik,
In al this world ne was ther non him lyk
To speke of phisik and of surgerye ;

Wel knew he the olde Esculapius,
And Deiscorides, and eek Rufus ;
Old Ypocras, Haly, and Galien.'

The chapter by Soranus is 'On the Nature of the Uterus and Female Pudenda', the first paragraph of which I have reproduced (Fig. 2), as also the prefatory note taken from Suidas, a Greek grammarian who wrote in the twelfth century A.D. a lexicon forming a kind of cyclopædia and dictionary: 'Soranus Ephesius, the son of Menander and Phœbe, lived some time at Alexandria, practised as a physician at Rome in the reigns of Trajan and Hadrian, and composed many beautiful books: Books about Women, four; Lives of Physicians, Selections, and Collections of Writings, ten books; and other things of interest.' Ermerins, in his revision of the text of Soranus, makes only a few verbal alterations in the chapter on anatomy, as published in this book.

The scientific accuracy and lucid description of this, the earliest account of the anatomy of the uterus, vagina, and external genitals, impressed me so much that, with the help of a friend better versed in Greek than myself, I made the following translation of it:

CHAPTER III.—THE NATURE OF THE UTERUS AND FEMALE PUDENDA

UTERUS.—The uterus, ἡ μήτρα, is called also ὑστέρα and δελφύς: μήτρα, because it is *mother* (μήτηρ) of the fœtuses born from it, or because it makes those having it mothers, according to some because it has a *measured* period (μέτρον χρόνου) for menstruation and bringing-forth; ὑστέρα, because it occupies, if not exactly, at any rate on the whole,² the *lowest part* of the female intestines; δελφύς, because it brings forth *brothers* (ἀδελφοί).³

¹ B. S. *Albini Tabulæ septem uteri mulieris gravidæ cum jam parturire mortuæ*. Lugduni Batavorum, MDCCXLVIII.

² Εἰ μὴ πρὸς ἀκρίβειαν ἀλλὰ κατὰ πλάτος.

³ Liddell and Scott give μήτηρ, a *mother*, as the derivation of μήτρα. With regard to ὑστέρα, they say that 'if from ὑστερος, the last or lowest part of the female intestines, it cannot be connected with the Latin *uterus*, which is probably akin to ἔντερα: but

ITS POSITION.—It lies in the space between the acetabula, between the bladder¹ and the rectum, resting upon the latter, but beneath the bladder, either in whole or in part, according to change in its size. For in infants it is smaller than the bladder, and hence comes to be entirely under it; but in virgins at puberty, it reaches the same height as the bladder. In those more advanced in age and in married persons, especially multiparæ, it is even larger, so that it extends to where the colon stops. It is still larger in pregnancy, as any one can see—the peritoneum and hypogastrium being pushed forward according to the development of the fœtus with its membranes and fluids. After delivery it becomes contracted, but retains a larger size than before pregnancy. Under these circumstances, accordingly, it is larger than the bladder, and does not lie right under it; ² for, in front, the neck of the bladder projects beyond, ending in the urethra, and stretched alongside of the whole vagina,³ but falls short of the uterus above. Behind, the fundus of the uterus lies higher than the fundus of the bladder, being under the umbilicus; so that the cavity of the bladder lies upon the neck of the uterus, and its fundus upon the cavity of the latter.

LIGAMENTS.—The uterus is connected by thin membranes, above with the bladder, below with the rectum, to the sides and behind with the parts springing from the ilia and sacrum. When these [membranes] are shortened by inflammation, it is dragged on and lies to the side;⁴ when they are weakened and relaxed, it falls down: not because it is an animal,⁵ as some have thought; but having, as it were, a sensitive-ness, and thus being contracted by astringents, and relaxed by emollients. The shape of the uterus is not convoluted, as in the brutes, but more like a cupping-glass.⁶ For, beginning from the rounded and broad end at the fundus, it contracts sensibly to the narrow mouth. The first and projecting part of it is called *στόμιον*;⁷ next comes the *τράχηλος*,⁸ then the *αἶχμή*;⁹ these last two together form the *κανλός*.¹⁰ Where it broadens out beyond the constriction of the neck we have first the *ῥομοί*,¹¹ then the *πλευρά*;¹² last of all the *πυθμήν*,¹³ beneath which is

more probably it is akin to *uterus* and not to *ὑστέρος*. They make *ἀδελφός* come from *δελφύς*, not *δελφύς* from *ἀδελφός*.

¹ This description is evidently taken from the dissection of a cadaver in the dorsal posture.

² *Under*, from the dissector's point of view; *behind*, in the erect posture.

³ Ermerins inserts *καὶ παρατρύπμενος* (*and being perforated*). He says that the codex has *παρατριβόμενος* (*being rubbed against it, i.e. being in close contact with it*).

⁴ It is interesting to note that, even at this early period, the effect of cellulitis in causing uterine displacement had been noticed.

⁵ As in the writings of *Aretæus*.

⁶ *Σικία*, literally a *gourd*; then a *cupping-glass*, because shaped like the long gourd. In the edition of Celsus by E. Milligan, an ancient brazen cucurbitula is figured; but the belly is rounder and the neck is foreshortened. Celsus tells us that it was used by pouring a hot liniment into the flask, the mouth of which was then applied to the skin.

⁷ i.e. *mouth*, now *os uteri*, by which term we shall translate it throughout.

⁸ *Neck*, now *cervix*.

⁹ *The narrow part of the neck*, now *isthmus*

¹⁰ *The stem*.

¹¹ *Shoulders*.

¹² Literally *ribs*, then *sides*.

¹³ Literally the *hollow or belly of a drinking-cup*; including more than what we now call fundus, which Soranus names *βάσις*.

the βύσις.¹ The whole space is called κύτος,² γάστρα,³ κόλπος.⁴ The *os uteri* lies in the centre of the female genital organs, for the cervix is closed in by the labia; ⁵ the os is removed from these, in some more, in some less, according to age: in adults, generally 3½ or 4 inches; ⁶ in those who have borne children, it comes to be nearer through elongation of the cervix. The size [of the *os uteri*] varies, and is in most persons normally as large as the outer end of the auditory meatus. It opens at certain times, as in the orgasm of coitus to receive the semen,⁷ during menstruation that the blood may escape,⁸ in pregnancy according to the growth of the embryo, and in labour to the greatest extent until it will admit the full-sized hand. In texture, it is soft and fleshy in virgins, like the sponginess of the lungs or the smoothness of the tongue; but in those who have borne it becomes more callous, like the head of a polypus, or, as Herophilus⁹ says, like the end of a bronchus—becoming hard through the passage of discharges and by parturition.

STRUCTURE.—The whole uterus is as far as possible fibrous,¹⁰ not composed of fibres alone, but also of veins, arteries, and flesh. Of these, the fibres come from the membranes of the spine, but the arteries and veins from the vena cava and the large artery lying on the spinal column—for two veins spring from the vena cava and two arteries from the large artery, of which one vein and artery run towards each kidney; but before these enter the kidneys they bifurcate, two branches going to each kidney and two embracing the uterus, so that the latter receives four vessels—two arteries and two veins.¹¹ From these, an artery and vein pass to each ovary.¹²

OVARIES.—The ovaries grow out from the side near the isthmus about opposite to the middle of the uterus.¹³ They are not of firm consistence, are glandular, and are covered with their own membranes. In shape they are, unlike the male organs, long and somewhat flat;

¹ The *lowest part or base*, now *fundus*. What we call the ‘body of the uterus’ Soranus thus divides into two portions: (1) the *pleura* or sides, corresponding in position to the horns; (2) the *puithmen* or widest part, corresponding to the rest of the body except the *basis* or *fundus*.

² The *hollow*.

³ The *belly*.

⁴ Literally a *hollow*, then a *bosom-like fold of a garment*. The term is usually restricted to the vagina, hence our word ‘*colpitis*’, and is thus used by Soranus further on; here it includes the cavity of the uterus.

⁵ Πτερυγώματα, literally *wings*; vide postea on ‘*Externa Genitals*’.

⁶ Literally five or six fingerbreadths, the fingerbreadth being about $\frac{7}{16}$ inch. This is more accurate than that given in Quain’s *Anatomy*, which makes it 4 inches along anterior wall and 5 to 6 inches along posterior.

⁷ Cf. J. Matthews Duncan’s *Lectures on Sterility*, London 1884, p. 131.

⁸ Cf. Burton’s ‘*Observations on the Cervix becoming more Patulous during Menstruation*’, *Brit. Med. Journ.*, 1884, ii. 607.

⁹ Cf. Chalcedon (B. C. 300).

¹⁰ Νευρώδης from νεῦρον, a sinew, nerve.

¹¹ It is difficult to understand Soranus’ description here. It is only on the left side that the uterine veins open into the renal. We must, however, remember that fifteen centuries must elapse before the idea of filling the vessels with wax, so as to allow of their being dissected out, springs up in the fertile mind of Swammerdam (1672).

¹² Δίδυμος, literally *double*, then *twin*, then *testicle* or *ovary*.

¹³ Παρ’ ἐκάτερον πλευρὸν ἀνὰ εἰς. ‘*Pleura*’ corresponds to the middle segment of the side of the uterus, vide *antea*.

and are round and broad at their base. The spermatic vessel from the uterus is carried out of each ovary, and, being placed along the sides of the uterus as far as the bladder, enters into the neck of the latter.¹ Whence it appears that the seed of the female, inasmuch as it is poured out, does not play a part in the production of life. Of this we shall speak when we treat of the seed.² There are some, amongst whom is Chius, who say that there are suspensory ligaments for the ovaries; and we have seen the same with our own eyes in a woman suffering from hernia, in whom during the operation the ovary fell down through relaxation of the vessels which support and surround it, and with these the suspensory ligament came down.³

SURFACES OF UTERUS.—The whole uterus is made up of two coats, which differ in their arrangement like parchment.⁴ The outer is more fibrous and smooth and firm and white; the inner is more fleshy and villous and soft and red⁵—intertwined throughout with vessels, which are most numerous and noteworthy over the broadest part of the body,⁶ where the seed becomes adherent, and from which the menstrual discharge takes place.⁷ Those two coats are kept together by softer and more fibrous bands; and, accordingly, when these are stretched, the uterus frequently falls down, the fibrous coat remaining in its place, the other one descending inverted.⁸ Further, commonly in multiparæ, the uterus has folds running towards the body, usually two, and closely folded, so as to be like felt; in those who have borne, the whole uterus is stretched out and becomes rounded.⁹ Diocles¹⁰ says that there are cotyledons¹¹ in the cavity of the uterus, called *πλεκτάναι*¹² or *κεραιαί*,¹³ which are nipple-like outgrowths, broad at the base and narrowing to the top; that they lie on both sides, being devised by Nature for the sake of teaching the embryo to practise beforehand how to draw at the

¹ It is not clear what vessel is here referred to. From the fact that it enters the neck of the bladder, we might suppose it to be the ureter; but, as it is distinctly said that it enters the ovary and also runs down the side of the uterus, it is more probably the uterine artery.

² Soranus evidently missed the discovery of the tubes made by Fallopius fourteen centuries afterwards, and supposed that the ova were carried into the bladder and ejected.

³ Perhaps the Fallopian tube is referred to here.

⁴ *Τῶν χαρτῶν.*

⁵ Soranus is here describing the wall of the uterus as seen on its two *surfaces*—the peritoneal and mucous membrane; we must remember that he is not describing the coats of the uterus as in section—an altogether modern method. In preparing parchment, two layers of papyrus were woven together.

⁶ *Πυθμήν*, the widest part of the body, vide antea.

⁷ This incidental reference to the menstrual discharge as coming from the body of the uterus is worthy of note.

⁸ Soranus apparently thinks that in Inversion the whole wall is not inverted.

⁹ Soranus is here apparently speaking of the two stems of the arbor vitæ; and does he here, like Kustner, refer to the arbor vitæ's being less marked in multiparæ than in nulliparæ? We note that he does not think it worth while to contradict the received view that the uterus consisted of several cavities; he contents himself with simply describing what he has seen.

¹⁰ Diocles lived about the end of the fourth century B.C.

¹¹ This word means (1) *the suckers or the feelers of the polypus*; (2) hence the *feelers* themselves; also (3) in plural, *certain vessels at the mouth of the uterus* of some animals (Hippocrates).

¹² Literally, *feelers* of the polypus.

¹³ Literally, *horns*.

nipples of the breast.¹ But they make anatomy speak falsely, for the cotyledons are not found; and what they say about them is contrary to Nature, as has been proved in treatises on generation.

SYMPATHETIC RELATIONS OF UTERUS.—We must not suppose that the uterus is essential to life, for not only does it fall down, but in some it may be cut away without causing death,² as Themiso³ has recorded, and they say that in Galatia pigs fatten after the uterus is cut out. Nevertheless, it affects sympathetically the stomach and membranes.⁴ It has, moreover, a certain sympathetic relation to the mamma: at all events, when it grows larger at puberty the breasts also swell out simultaneously; and although it brings the seed⁵ to perfection, yet the mammae prepare milk for the nourishment of the offspring when born; and when the menses flow freely the milk dries up, while as long as the milk comes freely the discharge does not appear; so also in those past their prime, when the uterus grows smaller the mammae likewise somehow waste away, and when the embryo is diseased their size is reduced—in fact when in the pregnant we see the breasts fall away and contract, we anticipate that there will be a miscarriage. So much for the nature of the uterus.

VAGINA.—The female pudenda are also called κόλπος γυναικείος.⁶ The wall is fibrous and somewhat rounded, like intestine, more roomy at its inner, and narrower at its outer end; and in it sexual intercourse takes place. It is attached internally to the cervix uteri, externally to the labia, inferiorly to the breech, laterally to the fleshy parts of the acetabula, superiorly to the neck of the bladder—for this last, as we have said, extending beyond the os uteri, and being placed close above the genitals, opens at its end into the urethra. Accordingly, it is evident that the vagina lies beneath the neck of the bladder, but upon the anus and the sphincter and the lowest part of the rectum. Its length, as we have mentioned above, varies not only with age, or with sexual intercourse, in which the cervix being elongated like the male organ, takes up some part of the vagina; but also some have by nature a longer cervix, and others a very much shortened one. The length [of the vagina] is in most adults four inches. It is certainly closed and narrower in virgins, being furnished with folds held together by vessels taking their rise from the uterus; these cause pain in first sexual intercourse when the folds are opened out, for they are broken, and discharge the blood usually seen. For the view is false that a thin partition-membrane has grown up, barricading the vagina; that this is broken, and causes pain at first sexual intercourse, or sooner when menstruation sets in; and that, grown thicker, it produces the disease called atresia. For in the first place, it is not found in dissection; and in the second place, in virgins it ought to offer resistance to examination with a probe, for the probe penetrates deeply; in the third place, if the membrane was the cause of pain in intercourse, excessive pain must necessarily accompany the appearance of menstruation, and not be delayed till coitus.⁷ Further,

¹ Soranus is evidently here poking fun at Diocles.

² Where is the recorder of recent statistics of extirpation of the uterus?

³ Quoted elsewhere by Soranus, but I cannot find when he lived.

⁴ Μήνιγγες—nervous system (?).

⁵ i. e. ovum or embryo.

⁶ Here used, as will be evident from what follows, of the vagina. He goes on to describe the vaginal walls, &c.

⁷ Soranus here combats some view that the hymen was always imperforate, and hence had to be broken even when menstruation sets in.

if the membrane's becoming thick caused atresia, we should find it in the same place constantly, in the same way in which we always see other parts, each in its own place. But in cases of atresia, the obstructing membrane is found at one time near the labia, at others in the middle of the vagina,¹ at others at the os uteri. So much for the vagina.

EXTERNAL GENITALS.—The parts seen outside are called *περνύγματα*,² forming, as it were, the lips of the vagina. They are thick, fleshy, and extending down beside each thigh, as it were, diverging from each other; above, they end in what we call *νύμφη*,³ which is the beginning of the two labia. In Nature this fleshy prominence is muscular, and it is called 'nymphē', through its being covered as brides are veiled.⁴ Below the clitoris another fleshy prominence lies concealed, which belongs to the neck of the bladder; it is called the urethra. The rough portion forming a fold within is called *χέλος*.⁵

BLADDER.—The female bladder differs from that of the male; for the former is larger, and has the neck curved, the latter is smaller with a straight neck.

This chapter forms part of the 'Gynæcology' of Soranus, as this has been handed down to us in a collection of gynæcological papers, without authors' names, preserved in the National Library in Paris, and known as the 'Parisinus Græcus 2153'. The MS. was published by Dietz in 1838, under the title *Σωρανὸν Ἐφεσίου Περὶ γυναικείων παθῶν τὰ σωζόμενα*. Dietz died before his investigations were complete, and the subsequent editor, Lobeck, issued the MS. as the writings of Soranus, though, as Ilberg points out, Dietz had already recognized that the Parisian text incorporated much of an unpublished work by Ætius. Thirty years later it was examined critically by Ermerins.⁶ Making use of Moschion's text-book on *Diseases of Women* to determine how much was of the time of Soranus, he eliminated the foreign material taken from Ætius, and restored the original arrangement of Soranus.

Moschion's *Diseases of Women* was reproduced in Vienna in 1793 by Dewez.⁷ It is in the form of a catechism, the first ten pages consisting of short questions: 'What is an obstetrician? By how many names is the uterus called? Where does the uterus lie? Of what nature is the uterus? Where lies the os uteri? How far is it distant and backward? . . . Concerning the menstrual cleansing, why is it so called?' &c.

Putting aside the first question, answered in the first section of Soranus which we have not translated, those that follow take up the topics treated in his anatomical chapter, and in the same order, with the

¹ *Αἰδοῖον*—here used for the vagina.

² i.e. wings—the *labia majora*.

³ Not what we now term the nymphæ (*labia minora*), but the clitoris, as is evident from his description of its relations.

⁴ *Διὰ τὸ ταῖς νυμφευομέναις ὁμοίως ὑποστέλλειν τὸ σαρκίον*.

⁵ i.e. a lip—the *labium minus*.

⁶ *Σωρανὸν Ἐφεσίου περὶ γυναικείων παθῶν*: Sorani Ephesii liber de muliebribus affectionibus. Recensuit et Latine interpretatus est Franciscus Zacharias Emerins. Trajecti ad Rhenum apud Kemink et filium, 1869.

⁷ *Μοσχίωνος περὶ τῶν γυναικείων παθῶν*, Moschionis de mulierum passionibus liber. F. O. Dewez, Viennæ. Apud Rud. Gräffer et Soc., 1793.

exception that the vagina and external genitals are passed over. The questions that follow are based on the topics of the next section of Soranus which deals with menstruation; and the topics throughout are on the whole the same as his, and in similar order. The form of the book is an instructive example of how systematic and thorough the teaching at that time must have been. It is a catechism with 152 questions and concise answers such as might easily be committed to memory; and it has this further interest, that it contains what was thought to be the earliest drawing of the human uterus. In Fig. 3 I have reproduced this drawing.

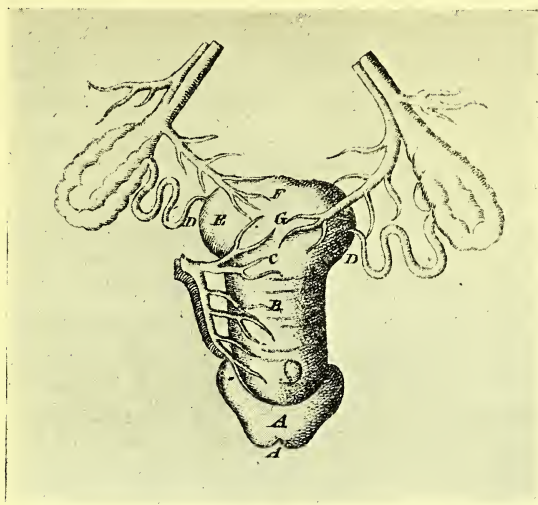
In the preface it is stated that the book was for the use of 'Latin matrons and obstetricians unskilled in the Greek tongue'. The original Latin form of this book was found by Valentin Rose in the Brussels Museum, and he has described it under the name of 'Gynæcia Muscionis'. I draw attention to this book by Moschion or Muscio, because it has been used to determine how much of the gynæcology of the 'Parisinus' may be ascribed to Soranus.

The most recent and complete critical study of the 'Parisinus' is by Ilberg, who in an important monograph¹ has recently gathered up the results of the work of these three previous critics, and added to them his own exhaustive study of the MSS. of Soranus and Muscio. His conclusion is that the writings of Soranus, as they have come down to us, are the work of a Byzantine physician, who had the good fortune to have before him the original work of Soranus, *Concerning Female Complaints*, dating from the second century, and also the sixteenth book of Ætius, a later production of the sixth century, and from them produced a new book under the same title as the original by Soranus. He believes, as the quotation from Suidas affirms, that the 'Gynæcology' of Soranus consisted of four books, which all suffered more or less in the compiler's hands. The first book is only fairly complete; the second, 'On the Care of Children', is better preserved, and has been handed down without transpositions or insertions. The third book has suffered more, and the fourth most of all, in the hands of the Byzantine compiler.

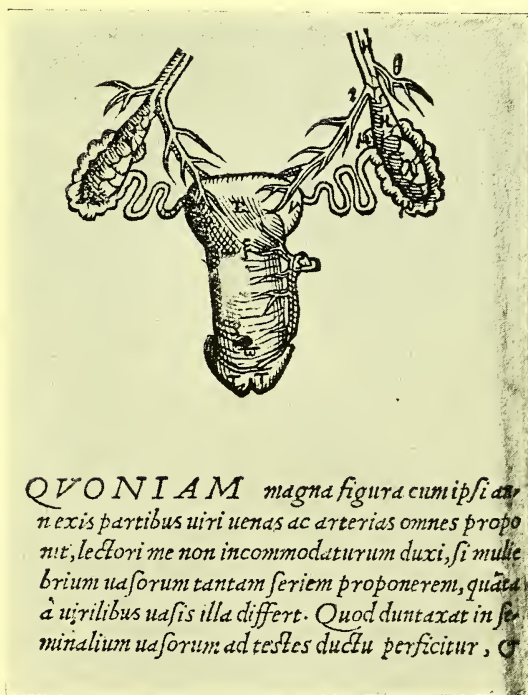
The illustrations of Moschion and Muscio have given rise to interesting discussion. The later Greek Moschion has one figure of the uterus which used to be considered the earliest drawing of that viscus. I have reproduced it in Fig. 3. In the first edition of the *Seven Books of Vesalius*,² at the end of the Third Book, I came on a drawing of the uterus (see Fig. 3), which so closely resembles the one in the Greek Moschion that

¹ *Die Ueberlieferung der Gynäkologie des Soranos von Ephesos*, Leipzig, Teubner, 1910. The book consists of three parts, dealing with, first, the Greek transmission of the 'Gynæcology'; second, an analysis of the compilation; and third, the 'Gynæcia of Muscio', which contains (1) an analysis of that work, and (2) the late Byzantine translation of it. In an appendix he has given a description of the Brussels MS. with its illustrations.

² *De humani corporis fabrica, libri vii*, first edition, fol. Basil, 1543.



A



B

FIG. 3. A, Figure of Uterus in Moschion. B, Drawing of Uterus from Vesalius.

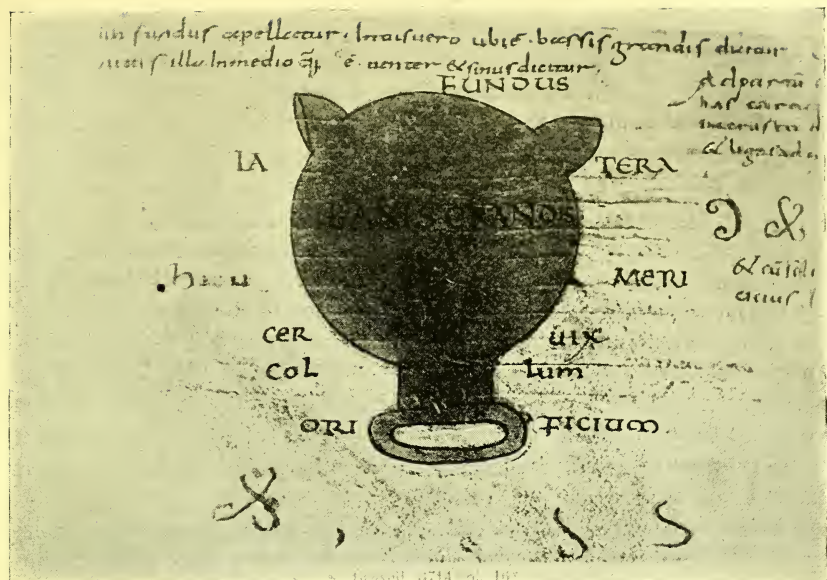
I cannot help thinking that this figure has been copied into a late version of Moschion from Vesalius.

The illustrations of the Latin MS. of Muscio in the Brussels Museum are thought by Ilberg¹ to belong to Soranus. This conclusion seems very doubtful. The names given to the parts of the uterus in the first drawing (see Fig. 4) are different from the terms employed in the chapter on anatomy; and the character of these imaginary pictures representing the position of the foetus in utero is not in keeping with his exact anatomical description. They may be of the same date, but it is difficult to believe that they are by the same hand.

The object of this paper is not to describe the gynæcological work of Soranus, but to draw attention to the method of this great teacher. Thanks to the laborious investigations of Dietz, Ermerins, Rose, and Ilberg, the buried figure of Soranus has been excavated, the adventitious matter accumulated round it through the centuries has been cleared away, and the work of this master-mind stands out in sharp outline. He belonged to the school of the Methodici, which allowed itself to be fettered by certain preconceived ideas, as distinct from the Rational School, which drew from collateral science.² In the introduction to the chapter on 'Anatomy' he defines his position to his school in the following humorous passage: 'But since we are about to pass to the description of what occurs in women in health, we must first explain the structure of the organs, which in part can be studied directly, in part

¹ Ilberg says that though it cannot be definitely proved, for a number of reasons it seems extremely probable that these are in the original form *Soranisch*. It is possible that both the Gynæcologies of Soranus were illustrated. While the numerous later copies appear unauthentic, that published by Sudhoff in his four volumes of *The Study of Medicine*, Leipzig, 1908, contains the series, preserved in Brussels, representing the thirteen positions of the child, which seem to be the oldest illustrations of this kind which we possess.

² The three schools into which the followers of medicine in ancient times were divided were known as the Empirical, the Rational, and the Methodist. The different standpoint of each school is thus described by Dr. Adams in his Preface to the seven books of Paulus Ægineta: 'The Empirics held that observation, experiment, and the application of known remedies in one case to others presumed to be of a similar nature, constitute the whole art of cultivating medicine. . . . The sect called the Rational, Logical, or Dogmatical, holding that there is a certain alliance and connexion among all the useful and ornamental arts, maintained that it is the duty of the physician not to neglect any collateral science or subject. . . . The sect of the Methodists, rejecting altogether the consideration of remote causes, which they held to be of no importance to the cure, and giving themselves up to too bold a classification of diseases, according to certain hypothetical states of the body in which they were supposed to originate, fettered themselves too much with a few general rules, which they held to be so universally applicable that they would scarcely allow of their being modified by incidental circumstances in any possible contingency.' Taking the description which Dr. Adams here gives of the Methodici, we find Soranus to have been much broader than his school; and, whatever his theory was, we should rather place him alongside of Hippocrates, Galen, and Ægineta in the Rational school.



A



B

FIG. 4 A, Uterus as figured in the earliest Latin MS. of Muscio.
 B, Drawing representing the Fœtus in Utero from the same.

by anatomy ; and although it is of no use, nevertheless, since it is held to be a part of enlightened education, we shall teach what is known of it. For we shall be more readily believed when we say that anatomy is useless, if we have first shown ourselves to be acquainted with it ; nor shall we provoke the suspicion that to cover our ignorance we have depreciated one of those subjects which are deemed useful.'

To bring out the range and accuracy of Soranus' knowledge of gynæcological anatomy, it is not necessary to print in parallel columns the teaching of modern anatomical text-books with this from the second century, as Dr. Troitzky of Kiev did in dealing with the teaching of Soranus on the hygiene of infancy, at the meeting of this Congress held at Rome in 1894.¹ The chapter on anatomy speaks for itself ; and its accurate description of the uterus stands out all the more clearly against the background of the teaching of Galen² when he touches on similar subjects.

Of the use Soranus makes of anatomy as furnishing a basis for clinical facts, we might quote such passages as the following : 'When these (the ligaments) are shortened by inflammation, it (the uterus) is dragged on and lies to the side.' Again, 'It (the os externum) becomes open at certain times, as in the orgasm of coitus to receive the semen, and during menstruation that the blood may escape' ; and 'the body of the uterus where the seed becomes adherent, and from which the menstrual discharge takes place.' Further, 'Most commonly in multiparæ the uterus has folds running towards the body, usually two, and folded like felt.' And lastly, 'In cases of atresia the obstructing membrane is found at one time near the labia, at others in the middle of the vagina, at others at the os uteri.' The references to operations for hernia in which the ovaries were seen, and to the extirpation of the uterus (apparently prolapsed), are of great interest.

The style of the chapter suggests that Soranus was not describing what he had studied himself by dissection, but rather gathering up the results of anatomical investigation done by many hands, probably in the dissecting rooms at Alexandria. His concise method of description

¹ Dr. Troitzky places in parallel columns quotations from the writings of Soranus and the teaching of our own time, and concludes that not only was Soranus the first great teacher of pediatrics in the Eternal City, but that more than one-half of his precepts with regard to the care of the newborn child remains unaltered to-day.

² In the section, *Γαλήνου περὶ μήτρας ἀνατομῆς βιβλίον*, he begins as follows : 'We shall treat of the situation of the uterus, its size and form, whence it hangs, how it is nourished, to what it is attached, what it touches, what things surround it, and what things are produced in the womb during pregnancy round the chorion and membranes embracing the foetus.' Further on he says that, 'in woman and in other animals which are like to women in the uterus, such as goats and cattle, . . . foetuses are found not in horns but in the rest of the whole cavity.' 'But these (as I think) mix up and suggest to the mind absurdities, since they cannot explain the use and action of the horns. And as my discourse would be too long and also unequal if I spoke of the use and action of the horns and not of the other structures round the uterus, on that account this subject is to be deferred to another treatise.'

contrasts with that of Fallopius, and even of Vesalius. It is interesting that this contribution to pelvic anatomy, while unknown to Mondino, was appreciated by Gabriel Fallopio. Thus, in the *Anatomical Observations* published at Venice in 1561, he says of the clitoris: 'It ends in a certain extremity which looks like the glans, being contained in a sort of skin like the prepuce, which skin unites those two structures of the external genitals, which are called by the Greeks, especially Soranus, Pterygomata.' And again, in describing the hymen, he refers to Soranus' description, and adds: 'For the satisfaction of that great man, let me say that the membrane does not seem to me very firm, and is perforated like a ring.'

To sum up the characteristics of this remarkable personality, we may say that in Soranus we have a man who broke through the traditions of his school, and placed anatomy in the forefront in gynæcological teaching; who in the second century had a knowledge of the anatomy of the female genital tract, which, so far as it went, was as exact as we possess to-day; whose writing bristles with facts, is never diffuse, and furnishes a striking illustration of how the matter of a man's teaching affects his style, making it at once concise and lucid. He takes his place among the 'brave old fellows' who 'put their lives into their books'. His 'Gynæcology' lives still; and of the single chapter on anatomy he might say with Horace, *Exegi monumentum ære perennius*.

[Friday Afternoon, August 8]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

THE HISTORY AND POWERS OF THE BARBER
SURGEONS IN GREAT BRITAIN

By G. PARKER, M.A., M.D.

THE combination of surgery with the barber's art is common in comparative ethnology. It is found, for instance, both in ancient Egypt and in Mohammedan countries to-day. Barber surgeons are mentioned in Germany as early as 1150, but we have few or no records of them in England before 1300. During the leprosy epidemic in Europe a fashion for bathing-houses arose, and the keepers of these sanatoria are said to have combined massage with minor surgery, bleeding, and shaving. This strange union of crafts appeared in England at a revolutionary period, and then persisted for 400 years as an ancient custom, though often more in form than in reality—and *the Companies of Barber Surgeons became a great Public Health Service under the State*. Like many other English institutions, in spite of its cumbrous form, it did excellent work, and got such great legal powers that (1) every class and rank of surgeons, with sometimes physicians and apothecaries, joined them, so that they tended to become a great federation or union of medical interests in each town. (2) These Barber Surgeons' Companies were also the chief licensing bodies in the towns for surgery. (3) Nearly the whole of the surgical education of the kingdom was carried out by them, partly through their system of apprenticeship, and partly through the excellent lectures, examinations, and anatomical teaching which they set up. (4) Finally, as a result of this, in later times they produced a crop of brilliant surgeons, such as Gale, Vicary, Clowes, Read, Woodall, Wiseman, Cheselden, and Percival Pott.

In France a guild of pure surgeons, the Confraternity of St. Como, 1268, became supreme and kept down the barber surgeons, and though we find mention of nineteen companies of them under the central rule of the *Premier Barbier du Roi* and his deputy in each town, they contrast strongly with the barber surgeons in England, who after a struggle in London absorbed the pure surgeons.

In Germany, as Woodall tells us, the tendency was for a small number to be appointed in each town for life as officials, when no others could practise. Whereas in England any qualified men could be admitted.

In the great majority of cases all records of Barber Surgeons' Companies in British towns have perished, e. g. every set of ordinances but three in the returns of 1388. However, I have *succeeded in tracing them in nearly twenty-five towns,¹ and in twelve places their ordinances also* for some date or other. The number of members was large. In London in 1527 they outnumbered every other trading company, having 185 members. In Bristol in the seventeenth century there were 265 admissions, or about 300 in practice, i. e. 70 or 80 at a time in a town of perhaps 18,000 people. Probably the local company supplied the country districts with qualified men. One company, the Newcastle one, still exists, and has ten members, who obtain the freedom by inheritance and are ruled by two stewards, as they were a Company of Barbers and Surgeons.

We must stop for a moment to consider a question of some importance. Did the barber surgeons rise to power simply because surgeons were excluded from other means of study? In Ireland and Scotland there were hereditary families who handed down traditional knowledge, but little of the kind existed in England, though individual laymen, priests, and monks studied both medicine and surgery.

Much has been said of the neglect of surgery by the universities, and of the division and separation of surgery and medicine, but abroad Montpellier, Bologna, Salerno, and Padua taught surgery as well as medicine. We are apt to be influenced by the fact that the University of Paris excluded both surgeons and the barbers, but though Paris was for a time an English town it did not entirely dominate English custom; I must therefore dissent from Sir W. Clifford Allbutt's saying that 'the Surgeons were not only illiterate but forbidden even the means of learning', for as soon as records of the English universities appear we find surgeons among the graduates, e. g. at a coroner's inquest in Oxford, 1302, we find a 'Magister' Rogerus cirurgicus and at Southwark in 1312 there is a 'Magister' Johannes cirurgicus. It is often forgotten that both the universities examined and licensed surgeons as well as physicians, how early we cannot say, but certainly, I think, before 1500. Antony à Wood mentions various surgeons who passed, and the Oxford form of licence continued down to 1874. At Cambridge, from 1505 at any rate, there are records of licences, and the statutes laid down that each candidate must do a certain amount of dissection and clinical work.² The numbers were

¹ London, Norwich, Bristol, Durham, York, Newcastle, Limerick, Cork, Dublin, Southampton, Ipswich, Hull, Chester, Worcester, Salisbury, Exeter, Lincoln, Reading, Beverley, Glasgow, Oxford, Hereford, St. Albans, Gloucester.

² 'Chirurgiæ studiosus faciat duas anatomias, tres ad minimum curationes se fecisse probat,' *Grace Book, Delta, of the University of Cambridge*, ed. J. Venn; while the petition ran, 'Supplicat Reverendis vestris A, B, ut studium decem annorum in

few, but so were the candidates for medicine. In fact, just as it was in the Victorian Age, it did not pay for a surgeon to spend time and money at a university where the clinical and anatomical opportunities were poor, but they could go there, and sometimes did. There were always a few university surgeons.

Next we are told that the Church forbade all ecclesiastics from teaching or studying surgery. This seems, like the reports of Mark Twain's death, to be greatly exaggerated. Whether or not men of rank from the time of Avicenna 'propter lassitudinem vel propter occupationem curarum' disdained surgery, as Guy de Chauliac says, there is very little in the ordinances of the Church against it. The Council of Tours, 1163, and the Lateran of 1139 are said to have forbidden surgery to the clergy. As a matter of fact, they say nothing about it, or about them, but forbid monks to go out of their monasteries to study medicine or secular law or to weigh out drugs.¹ There are plenty of regulations elsewhere ordering both priests and monks to attend to their work and abstain from getting money at other occupations. The basis of the charges seems to be a decretal of 1316, which forbade priests to act as judges in capital criminal cases, and to be officers in territorial troops, and, finally, forbade the practice of surgery to priests, deacons, and subdeacons.² This is long after the division of surgery and medicine had taken place, and its importance is lessened by the fact that exemptions were clearly allowed, as in the instance of Chauliac himself, and possibly in another decretal of the same date, which discusses the case of a monk whose patient had died after an operation in the neck, he being a skilled and careful surgeon and the patient disobedient. Finally, whatever the special circumstances of these decretals were, there is the great fact that they do not affect in any way the ordinary university student nor the great mass of monks, both of whom were in minor orders only.

On the whole, I am very sceptical as to whether the Church really did keep any leisured ecclesiastics from the study or practice of surgery.

Though I deny, then, that barber surgeons were created by the refusal of the Church or of the universities to have anything to do with surgery, they were remarkably fortunate in appearing about the year 1300.

The field was open for them. There were few university or other surgeons or physicians to compete with them. On the other hand, it was (1) a period of extraordinary social changes of all kinds, such as the first representation of local communities in a national parliament, the economic upheaval of the Black Death, followed by the enfranchisement of serfs and the Peasant Revolt of 1381. (2) Soon after this the

chirurgiâ . . . cum approbatione peritissimorum in eâdem sufficiat ei ad practicandum in eâdem facultate, ita tamen ut eius cognitio prius examinetur et approbetur a Regio in medicinâ professore,' Gunning, *Customs and Ceremonies*, p. 141.

¹ Canon 9 of the Lateran Council and Canon 8 of Tours.

² Decret. Greg. ix. Lib. iii. 50, cap. 9.

Hundred Years' War caused a great demand for military surgeons abroad with good pay and the chance of great booty. (3) More important than all was the new social organization of craft guilds which spread through the whole country and converted the insignificant individual barber surgeons into a powerful gild in each town. The old family system of industry was exchanged for a division of labour, and groups of artisans arose and were formed into societies called guilds, fellowships, fraternities, crafts, or mysteries, and later on companies, or incorporations.

The Royal Government at first favoured them as a balance against the town communities, but the towns quickly recognized their value for police purposes and favoured them also. The Barbers' Guilds, as the only organized bodies of medical practitioners, were clearly capable of improving their knowledge and practice, and were promptly accepted by the towns as a Public Health and Sanitary Service, and invested with the necessary powers. Such a gild was a guarantee of good work and also of a steady supply of good workmen, who provided insurance for themselves in sickness, education for their successors, and under pressure from the town authorities could be got to attend some of the poor gratuitously. See Ashby, *Introduction to the Economic History of England*.

London seems to have used the barbers to detect lepers and to prevent these entering the city as early as 1310. They were already a gild under a warden.

The power of the guilds to compel the submission of outsiders was clenched by the Act of Parliament of 1363, which ordered every craftsman to be enrolled in a gild, while the Act of 1387 compelled reports of all guilds to be sent in. They obtained a monopoly of practice and the right of regulating the work and behaviour of their members.

In London the struggle began between the barbers and a small gild of pure surgeons to possess this power of oversight and inspection. The latter got powers from the city in 1369 and 1390, but the barbers were victorious in 1376 and 1415. It was ruled in 1410 that the surgeons' powers should not apply to the barbers 'not only in shaving, cupping, bleeding, or any other thing pertaining to barbering, but also in such practice of surgery as is now used, or in future to be used within their craft'.

In the fifteenth century the Barber Surgeons' Guilds made steady progress. When the Treaty of Troyes gave national peace for a time, Parliament in 1421 enacted the first law regulating the practice of Medicine and Surgery in England. Dr. J. A. Nixon has pointed out this fact, which has been generally overlooked. In reply to a petition against unlicensed practice, Parliament enacted that the Council should issue ordinances¹ by the authority of Parliament to punish persons who should henceforth

¹ For the distinction between Statutes and Ordinances see Stubbs, *Constitutional History*, ii. 584.

practise the arts of medicine or surgery unless they had been first approved, in medicine by the universities and in surgery by the masters of that art.¹ There were already two licensing bodies for surgery, the gilds and universities, and therefore I suggest Parliament used the wider phrase *les mestres de cett arte* to include both.

In London in 1423 another step in medical organization, but a transient one, appears. A united college of physicians and pure surgeons was made to rule all practitioners in the city. The local barber surgeons naturally rebelled and pleaded the city grant of 1415. The city thereon confirmed these rights in 1424, and the new college broke down. It was the old story of the Paris struggle with the Fraternity of St. Como and the physicians, but here the barbers were victorious.

As the gilds had now such great powers, Parliament in 1436 enacted that their ordinances must receive the sanction of the local magistrates.² This forms another step in State regulation. Numbers of Barber Surgeons' Companies throughout the country then applied for legitimization. Bristol got its ordinances passed in 1439, and the company had its place at the city feasts at least in 1468; Lincoln followed in 1440; Newcastle in 1442. We hear of Salisbury in 1458. Durham ordinances date from 1468; Exeter accepted them in 1487. At Ipswich the barber surgeons appear in the procession of 1474, and the Hereford barbers in 1503, while the gild of Edinburgh barbers copied the English fashion by getting these ordinances confirmed by a Seal of Cause from the city in 1505 'for the crafts of surgeons and barbouris', giving them the monopoly of surgery, barbery, and the sale of alcohol.³

Various craft gilds, too, at this time found it worth while to obtain a charter from the king. The Dublin barbers thus received a charter from Henry VI in 1446 'to establish the art of surgery', and Edinburgh got one from James IV in 1506. The London Barber Surgeons, after their recent troubles, thought it well to have protection, and obtained from Edward IV their first royal charter in 1462; but when their ordinances

¹ *Rotuli Parliamentorum*, iv. 130, 158. Robert Hare translates it thus: 'nequis exerceat practicam in artibus medicinae et chirurgiae nisi prius in Universitatibus fuerit approbatus, viz. in medicinâ apud Universitates et in chirurgiâ apud magistros ejusdem artis.'

² The old antagonism between the craft gilds and the gilds merchant representing the town communities, such as appeared in London as to the weavers in the time of John, had diminished; but it was clear that if the craft gilds were to have a monopoly of each art, and if the barber surgeons especially were to be a great public medical service, the town communities must rule them. Moreover, a tendency had appeared for the journeymen or bachelors to join gilds or unions of their own, such as became almost universal in France. Parliament had recently taken action against such combinations of masons. On both grounds it was desirable to give the local authorities supervising powers.

³ How they lost the monopoly of making and selling whisky, I do not know. Scotchmen hint that it is due to the Union. Had they retained it, there might be no need of the present Scottish Temperance Bill, or perhaps of the Carnegie benefactions.

required some revision, they obtained the sanction of the city magistrates according to the Act. The London pure surgeons had revised their ordinances just before the Act, but they then numbered only seventeen persons, and as the struggle with the barbers was hopeless, they at last made an agreement or composition, by which the two bodies agreed to act together in licensing and inspection, 1493.

Under the Tudors a flood of legislation completed the State regulation of medicine. The great law of 1421 was defective in searching out unlicensed practitioners, and the university output of licensed men was still hopelessly small.

Henry VIII then in 1511 picked out the bishops as the only State officials who could detect and punish offenders throughout the country districts and the towns in their visitations of every parish.¹ He gave them duly qualified boards of assessors, the right to examine and license both physicians and surgeons, and the duty of searching for and punishing offenders. Accordingly they appear as one of the licensing bodies down to about 1785, and though visitation inquiries are hard to find for a time, I have discovered in the seventeenth century inquiries after unlicensed men in no less than sixty diocesan visitations. The rights of the universities were safeguarded under the Act, and though it is not clear how the London Barber Surgeons' powers were protected, no conflict occurred with them for 150 years, and indeed their charter was confirmed in 1512, directly after this Act. There were thus three licensing bodies in London. and to these Henry added a fourth by incorporating the Royal College of Physicians in 1518. This was completed by the Act of 1522, and also by that of 1541, which laid down that medicine includes surgery as a special member and part of the same, and enacts that these physicians might practise in any part of the kingdom.

The pure surgeons of London and the barber surgeons were finally united by the statute of 1540, which confirmed all their powers, but insisted that no one practising barbery might work at surgery too. The study of anatomy and surgery was provided for, and this became the model of the best companies everywhere. Space forbids my entering into the success with which scientific work was carried on in London, York, Norwich, Newcastle, Bristol, and Salisbury, and the number of skilled surgeons who were trained up.

The student in London had to be apprenticed for seven years, and attend courses of anatomical and surgical lectures by the best teachers in the kingdom. After being ploughed more or less often, he received his licence, but still had to attend frequent postgraduate lectures and demonstrations and read lectures in his turn. Four times a year a body was dissected, and private tutorial classes existed. On Tuesdays there was generally a lecture on Surgery or Anatomy. As an example of a provincial

¹ It may be thought that this was a mediæval custom, but so far all research has failed to find episcopal licences for surgery in earlier times for laymen.

school, we may take Bristol, where the anatomical theatre still exists. No man could practise at Bristol unless he had been passed as skilful in the art, and admitted both a freeman of the city and a member of the company. Heavy fines were incurred by the neglect of a patient or malpractice, and a consultation was enforced in serious cases or major operations.

Historians have been puzzled by an Act of 1542, which seems to throw open surgery to any unqualified herbalist or quack, and blames most bitterly the surgeons for their greed for lucre and neglect of the poor. It is a grim jest to find the Government which in 1539 had swept away the hospitals and almshouses with the monasteries, till the sick died in the streets, attempting to divert the blame to the medical profession as the cause of the distress. The Act may be construed, indeed, to refer to gratuitous practice only, and no licensing body seems to have been checked by it, unless the absence of visitation inquiries for some years is a result.

In 1547 the funds of Barber Surgeons' Companies for the maintenance of chantries were confiscated like those of other gilds, their other funds being untouched.

A large part of the quacks of the time claimed magical powers, and a new development of the theory of witchcraft led to serious practical dangers to the life of Elizabeth and her ministers. Hence the great statute of 1563, which flooded the law courts with trials for witchcraft, and led to the witch mania. The Government also took action in another matter and handed over the care of surgical and other apprentices to the magistrates instead of to the officers of the gilds.

At the opening of the seventeenth century this State system was at its greatest height of activity. It is curious to note that in Scotland Peter Lowe in 1599 obtained a charter for a Faculty of Physicians and Surgeons in Glasgow and the district, and being imbued with continental ideals tried to exclude the barbers as a degraded class. Circumstances were too strong for him, and in 1656 the municipality united them with his surgeons under a Seal of Cause as a charter.

While in the best companies the practice of surgery and of barbery was not allowed to the same individual, companies of different arts were freely combined for legal purposes. Thus at Salisbury in 1612 to the barber surgeons were added the silkweavers, in Durham the ropemakers, in Chester, Worcester, and Newcastle the chandlers. There was ancient precedent for this in England and abroad. Thus at Florence, in the great medical gild of which Dante was a member, thirty-six crafts, such as bookbinders, artists, and mercers, were included. Gradually, too, the inclusion of honorary members, who practised no craft, increased, as sons of wealthy members inherited their freedom.

The examination and licensing of army and navy surgeons and the inspection of naval outfits and sea-chests showed the official status of the companies, as we see in the pages of Woodall. The new Bristol

Ordinances of 1652 devote much space to the subject besides arranging for the gratuitous treatment of the poor.

In the early part of the eighteenth century a great change took place, the details of which are most obscure. These great and wealthy companies were building themselves new mansions and anatomical theatres in London, Bristol, and Newcastle. At the last place a wonderful rose-garden was laid out around their hall, and the plate and paintings of the London Company are still a glory of the city. Suddenly their power everywhere collapsed. They and other trading companies, in spite of the stringent laws in their favour, were unable to maintain the monopoly of trade for their members. Their very existence depended on this. How far this change flowed from the struggle against monopolies, which had marked the Great Rebellion fifty years before, is not clear, but companies of all kinds felt it. Internal dissensions, which had long existed in Scotland, now suddenly appeared in England, and in some towns the barbers and surgeons, after a nominal union for centuries, insisted on separation, and the end came approximately at Edinburgh in 1695, Glasgow 1719, Dublin 1721, Bristol 1742, and London in 1745. Historians have pictured the learned and polished surgeons as finding themselves socially in a degrading alliance with plebeian barbers, but this is perhaps an after-invention of a later age when the class of hospital surgeons (whom the flood of new hospitals and infirmaries produced) looked back on their predecessors.

There is much evidence that the separation was really a question of money. If the legal monopoly had broken down, and if family practice was also absorbed by the new apothecaries, there was no reason for clinging to a very expensive livery company. Foreigners, i. e. men living outside the city bounds, began to come in and compete with the helpless companies. Clear reasons for the separation are rarely given, and the surgeons, it must be confessed, had grasped as much of the money and power of the companies as they could, and, when membership ceased to be remunerative, they threw it over. In some places we find no quarrel between surgeons and barbers, but the end of their activity came all the same, at Norwich about 1723, at York about 1781, and at Newcastle about 1778.

It is a narrow view which sees only internal professional causes for an economic change which affected the whole of English industry and trade, leading to the individualism and *laissez faire* system of the eighteenth century. Socialism and individualism have risen alternately to power in a cycle as men have despaired of the results of either. In the eighteenth century they preferred the anarchy of unlicensed practice to any remodeling of the ancient safeguards, and they got it.

ANNALS OF BARBER SURGEONS

XIIth Century.

- 1133. St. Bartholomew's Hosp. Charter.
- 1135. Third Lateran Council.
- 1150. Barber Surgeons in Germany.
- 1163. Council of Tours.

XIIIth Century.

- 1250. Craft Gilds, England.
- 1268. College of St. Como, France.

XIVth Century.

- 1302. 'Magister' Rogerus Cirurgicus at Oxford.
- 1308. London B. S. Gild under a Warden.
- 1310. London B. S. Keeper of Newgate.
- 1312. 'Magister' Johannes de Southwerk.
- 1316. Fourth Lateran Council.
- 1318. 'Magister' Petrus the king's surgeon.
- 1345. York B. S. sent to Bruce.
- 1348. Oxford B. S. Ordinances.
- 1349. The Black Death.
- Norwich B. S. Ordinances.
- 1363. *Statute*, all craftsmen to join Gilds.
- 1369. London Surgeons obtain oversight.
- Lincoln B. S. Ordinances.
- 1370 (c.). Apprenticeship in all Crafts for 7 years.
- 1376. London B. S. obtain oversight.
- London B. S. divided into Barbers and Surgeons.
- 1381. Peasant Revolt.
- London B. S. Hall existing.
- 1388. *Statute*, Ordinances of all Gilds to be reported to London.
- 1390. London Surgeons' powers confirmed.
- 1395. Bristol B. S. Ordinances.

XVth Century.

- 1400 (c.). York B. S. Ordinances.
- 1410. } London B. S. powers confirmed.
- 1415. }
- 1421. Parliament forbids unlicensed practice.
- 1423. London Union of Physicians and Surgeons.
- 1424. London B. S. powers confirmed.
- 1430. Beverley B. S. appear.
- 1436. *Statute*, Gild Ordinances require sanction of Magistrates.
- 1439. Bristol B. S. Ordinances sanctioned.
- 1440. Lincoln B. S. Ordinances.
- 1442. Newcastle B. S. Ordinances.
- 1446. Dublin B. S. Royal Charter.
- 1458. Salisbury B. S. appear.
- 1462. London B. S. Royal Charter.
- 1468. Durham B. S. Old Ordinances.
- 1474. Ipswich B. S. in City Procession.

- 1482. London B. S. New Ordinances.
- 1486. York B. S. New Ordinances.
- 1487. Exeter B. S. Ordinances or Incorporation.
- 1493. London B. S. and Surgeons' Agreement.

XVIth Century.

- 1503. Hereford B. S. in City Procession.
- 1505. Cambridge University licence for Surgery.
Edinburgh B. S. Seal of Cause from City.
- 1511. *Statute*, Bishops' licences for Surgery and Medicine.
- 1512. London B. S. Charter confirmed.
- 1514. *Statute*, London Surgeons exempt from Juries.
- 1518. Royal College of Physicians founded.
- 1522. *Statute*, R. Coll. Physicians' powers.
- 1530. London B. S. New Ordinances and lectures.
- 1540. *Statute*, London Surgeons and B. S. united.
Chester B. S. new Charter (ordinances).
Statute, Physicians exempt from Juries, may practise surgery.
- 1542. *Statute*, Herbalists freed from penalties.
- 1547. *Statute*, Gilds' religious trusts sequestrated.
- 1555. York B. S. lectures.
- 1561. Norwich B. S. and Physicians' lectures.
- 1563. *Statute*, Apprentices regulated.
Statute, Witchcraft a capital crime.
- 1563 (c.) St. Albans B. S. existing.
- 1567. Edinburgh B. S. exempt from Juries.
- 1572. Dublin B. S. Royal Charter.
- 1592. York B. S. New Ordinances.
- 1599. Glasgow Faculty of Physicians and Surgeons.

XVIIth Century.

- 1613. Edinburgh B. S. Royal Charter.
Salisbury Silkweavers joined to B. S.
- 1614. Salisbury B. S. New Ordinances.
York B. S. Anatomy and Surgery lectures.
- 1617. London Apothecaries' Charter.
- 1641. Newcastle B. S. Hall built.
Statute, Edinburgh B. S.
- 1648. *Statute*, Edinburgh Surgeons.
- 1652. Bristol B. S. New Ordinances.
- 1656. Glasgow Barbers joined to Surgeons by letters of Deaconry.
- 1658. Durham B. S. joined to Ropemakers.
- 1670. Bristol B. S. quarrel with Bishop.
- 1671. Newcastle B. S. New Ordinances.
- 1673. Salisbury B. S. New Ordinances.
- 1677. Worcester B. S. joined to Chandlers.
- 1695. Edinburgh Surgeons and Apothecaries united.

XVIIIth Century.

- 1703. R. Coll. of Phys. *versus* Rose. Apothecaries' powers.
- 1712. Dublin University Medical School.
- 1714. Hull B. S. Ordinances.

- 1715. London B. S. quarrel with Bishop.
- 1719. Glasgow separation of B. and S.
- 1723. Norwich B. S. officials cease.
- 1730. Newcastle B. S. new Hall built.
- 1736. First Provincial Hospitals. Bristol and Winchester.
- 1742. Bristol B. S. last public appearance.
- 1745. London B. S. separated.
- 1778. Edinburgh R. Coll. of Surgeons.
- 1781. York B. S. records cease.
- 1784. Dublin, R. Coll. of Surgeons, Ireland.

XIXth Century.

- 1800. R. College of Surgeons, England.
- 1815. Apothecaries Act.
- 1839. Newcastle B. S. Hall let.
- 1840. Dublin B. S. Company dissolved.
- 1847. Act abolishing trading monopolies.
- 1854. Oxford B. S. Company ends.
- 1858. Medical Registration Act.
- 1867. Poor Law Infirmaries.
- 1886. Medical Act amended.

[Monday Morning, August 11]

SECTION XXIII
HISTORY OF MEDICINE
INDEPENDENT PAPER
THE HISTORY OF SMALL-POX

BY DR. JOHN C. McVAIL

As the history of vaccination is dealt with in a separate paper,¹ the following notes on the history of small-pox do not extend beyond the end of the eighteenth century.

ANTIQUITY AND PREVALENCE

The prominent place which small-pox has occupied in the world of medicine, especially prior to and in the early days of vaccination, is indicated by the amount of time and attention devoted to the discussion of its antiquity and prevalence by medical historians. In this country Freind, Holwell, Woodville, Willan, Moore, and Creighton are among the principal writers. Abroad the names of Gruner, Krause, Haeser, and Hecker may be mentioned. Quite recently a valuable history by Dr. P. Kübler, of the Medical Department of the Royal Prussian War Office, has been translated by Dr. A. E. Cope and is being published serially in the *Medical Officer*.² It contains a most useful compendium of the researches and conclusions of previous writers.

The earliest evidences of a knowledge of small-pox belong to Hindustan and China, long before the Christian era. Inoculation as well as small-pox is said to have been the subject of Brahmin observances prescribed in the Atharva Veda. As to the disease in ancient Greece and Rome there has been much controversy, but the references seem too vague to afford certain proof. In Arabia the well-known treatise on small-pox and measles by Rhazes, physician to the hospital at Bagdad in the tenth century A. D., makes reference to writings on small-pox by Ahron in the seventh century and other writers in the eighth and ninth. The Arabian theory of its causation indicates its prevalence. The disease is an effort of nature to get rid of impure matter in the system introduced before birth by the menstrual blood. This view continued to be repeated until in recent centuries disease causation became a subject of observation, not merely of fanciful speculation.

But so early as 980 A. D. by Ali Abbas, and much more definitely by Avicenna a few years later, the infectious nature of small-pox was

¹ This paper was not read.

² Hodgetts, Ltd., 36-8 Whitefriars Street, London, E.C.

recognized. This was the case also in England in the fourteenth century, but not invariably afterwards, Sydenham's well-known view being that the disease was due, in epidemic times, to the constitution or condition of the atmosphere. Van Helmont, early in the seventeenth century, made an approach to modern views by attributing small-pox to a poison of an infectious quality, and Athanasius Kircher sought for a living contagium by means of his rudimentary microscopes (Kübler).

In Europe, Gregory of Tours describes an epidemic which he witnessed in the latter part of the sixth century, and which seems unquestionably not measles but small-pox. It was probably the same epidemic to which Marius, Bishop of Avenche, applied the term 'variola'. The main prevalence of the disease in the Middle Ages in Europe is attributed by the historians who wrote a century ago to the Arabians, who carried it by their wars to the peoples of the Mediterranean shore, whence the Moors bore it north, so that it reached Central Europe and England by the ninth and tenth centuries. The Irish monastic chronicles, however, record various earlier outbreaks in the seventh and eighth centuries as well as subsequently, the earlier name of the disease being *Bolgach*, and the later *Galar Breac*, both of which terms were still in use in the middle of the nineteenth century, and *Galar Breac* even at the present day, or at least so recently as twenty years ago. In England an Anglo-Saxon leech-book of the tenth century contained six prescriptions for pock disease, the local treatment including the emptying of the pustules with a thorn, this being contemporaneous with Rhazes's use of a silver needle for the same purpose.¹ The physicians, Gilbert Anglicus, in the reign of Edward I, and John of Gaddesden, in that of his successor, both wrote of small-pox, following mainly the Arabian authors.

Through the prevailing darkness of these times incidental references in the Harleian and Cottonian MS. to miraculous cures of the disease and of its resulting loss of sight, and to the wearing of protective charms and amulets, and the recitation of special prayers, bear witness to the place it held in the public mind.

With the slow revival of learning there appear various references to small-pox, clearly enough distinguishable from others relating to syphilis, of which the pandemic had begun in 1494, and which was often named great pockes or French pockes, though when no adjective is used the context does not always show which disease is meant. Later, Shakespeare, Ben Jonson, Fletcher, and Donne all refer to small-pox.

STATISTICS OF PREVALENCE

The earliest approach to statistical detail is perhaps to be found in the data furnished to Simon² by the Danish Government, and relating

¹ *Leechdoms, Wortcunning, and Starcraft of Early England*, by Rev. Oswald Cockayne. Longmans, 1865.

² *Papers relating to the History and Practice of Vaccination*. Eyre & Spottiswoode, 1857.

to Iceland from the thirteenth century onwards. Those for Geneva from 1580 to 1760 come next, and are in annual detail. The London Bills of Mortality date from 1629, and Simon gives many figures relating to European countries in the eighteenth century. He also quotes from various authorities as to epidemics in the New World, where the disease owed its introduction largely to slave ships and spread with the virulence characteristic of its manifestations in new fields for infection.

For London in the seventeenth and eighteenth centuries, Dr. Farr (*Vital Statistics*, p. 304) calculates that in the period 1660-79 the average annual death-rate per million from small-pox was 4,170; in 1728-57, 4,260 per million; in 1771-80, 5,020 per million; in 1801-10, 2,040 per million; and in 1831-5, 830 per million. In Manchester, whose population in 1773 was 22,481, there were in the six years 1769-74, 589 deaths from small-pox, or at the rate of 4,359 per million per annum. In Liverpool, for the same period Haygarth gives figures showing an annual average small-pox death-rate of 6,394 per million. In Sweden, 1774-1800 inclusive, the rate was 2,049 per million.

It is seldom, however, that attempts are made to state small-pox death-rates on a population basis as there were no official numberings of the people. The common method is to give small-pox deaths as a proportion of the total deaths from all causes, or occasionally to state how many persons in a given population had not had small-pox. In 1722, in the village of Ware in Hertfordshire, with a population of 2,515, at the end of a small-pox epidemic only 302 persons had never had the disease. In Chester in 1775 only 1,060 persons had never had small-pox in a population of nearly 15,000. In Kilmarnock, 1728-64, of every 1,000 children born alive 161 died from small-pox. In Glasgow, 1783-1800, of 31,088 deaths from all causes, 5,959 were due to small-pox. In Berlin, 1758-74, of 81,133 deaths from all causes, 6,705 were from small-pox, and for the period 1783-1800 the corresponding figures are 98,643 and 7,668.

SMALL-POX INOCULATION

This practice, which had long been known in the East, was begun in England in 1721, but after eight or nine years fell into abeyance owing to the evil results of the supposed improvements which the prevalent pathology sought to make on the simple procedure introduced by Lady Mary Wortley Montagu from Constantinople. Instead of a mere superficial scratching or puncturing of the surface, with direct introduction of small-pox matter from a favourable case of the disease, there was set up a practice of large and deep incisions, resulting in fever, inflammation, and much suppuration, all with a view to removing from the system supposed peccant variolous matter. Severe illnesses and some deaths naturally followed, and inoculation fell into disfavour till it was revived, from about the middle of the century, by milder and safer methods, so that the deaths fell from 1 in 50 cases to 1 in 500 or 600 or

more. In the hands of Gatti, an Italian inoculator who practised in Paris, the operation seems to have been reduced occasionally to a mere formality, with no protective value. The practice was largely followed in nearly all European countries, until vaccination displaced it. A good deal of discussion has taken place as to its effect on small-pox mortality in the latter half of the eighteenth century. On the one hand, it protected the inoculated individuals. On the other, it was capable of spreading the disease. If in any place it was almost universally or even very extensively practised it would certainly be very advantageous to the population as a whole, but where comparatively few were variolated they could set up epidemics of the natural disease. The Royal Commission on Vaccination wisely reported that they were unable to determine where the balance of advantage had been. But, as has just been indicated, it seems quite possible that in the earliest years of the nineteenth century, the diminishing amount of small-pox inoculation may have been more harmful in spreading infection in populous places than its much more general practice could have been in the latter part of the eighteenth century. The operation was made illegal in England in 1840.

Passing from the subject of the antiquity and prevalence of small-pox to other points in its history, type of disease, epidemic periodicity, age incidence, and case mortality require mention. The last three are very closely related to each other.

TYPES OF SMALL-POX

The history of the disease indicates very decided difference of type in respect both of time and place. Wagstaffe said there is a kind of small-pox which a doctor cannot cure and another kind which a nurse cannot kill. Mildness of small-pox in individuals was no doubt sometimes due, in periods when the disease was universally prevalent, to protection remaining from a previous attack, probably many years before, and in such circumstances the second attack would very likely not be regarded as true small-pox, but as waterpock, hornpock, nirl pock, swine-pox, or the like, this attitude being due to the common, but erroneous, medical opinion of the time, that genuine small-pox could never recur in the same individual. Such recurrence, though rare, is not impossible. But apart from mild cases due to relative immunity acquired in this way, and apart from any confusion in very early times between small-pox and measles, it is clear that there were epidemic prevalences of mild types or 'sports' of small-pox. Jenner in 1789—before he had developed the practice of vaccination—considered the possibility of using an epidemic of such mild small-pox to provide matter which could be more safely used than ordinary small-pox for variolous inoculation. In 1806 a similar mild type of disease was reported by Dr. Adams, of the Small-pox Hospital in London, under the name of pearl pox. Of late years in America small-pox has assumed the same much modified characters, and the fatality rate has been exceedingly low.

In Britain, the disease within recent years has varied in type, and there has even been some evidence of simultaneous existence of two forms, one of ordinary severity, perhaps introduced from the Continent of Europe, and the other exceptionally mild, as if of the American variety.

EPIDEMIC PERIODICITY

In pre-vaccination times, in the period for which statistics are available, the frequency of small-pox epidemics differed in different places. A common period of recurrence was four or five years, as in Geneva, Copenhagen, and Kilmarnock. In large towns the frequency was rather greater. In Edinburgh, 1744-64, there were seven epidemics; in Glasgow, 1783-1803, about six years stand out beyond the rest. In London the disease was nearly always present, and was specially so in about one year in three. In Vienna the average length of the intervals was about four years; in Berlin there were six epidemics from 1759 to 1801, and in Boston, U.S.A., twelve epidemics from 1649 to 1792. In rural areas the outbreaks were less frequent than in populous places, and the disease was quite absent for long periods from isolated insular communities.

Manifestly, epidemic periodicity would have, before vaccination was practised, a large direct influence on age incidence, and, as we shall see, an indirect influence on fatality.

AGE INCIDENCE

Apart from vaccination small-pox was a disease of childhood, just as measles and whooping-cough were and are. Like measles, small-pox could attack any period of life, but during childhood, in most communities, very nearly every one was attacked, and all who survived thenceforward possessed the resulting immunity, which was commonly, but not invariably, absolute and lifelong. Epidemics, therefore, had their ravages mainly confined to childhood. Exceptions occurred in respect of rural districts where the disease came less frequently, so that when outbreaks occurred the range of ages was higher, and where country dwellers migrated at any age to towns or cities they would be attacked there unless immunity had already been obtained. Independently of acquired immunity it may be estimated that from 2 per cent. to 5 per cent. of the population enjoyed natural immunity.

Data as to age incidence relate almost wholly to mortality, hardly ever to morbidity. In Geneva, in the 180 years from 1580 to 1760, of every 1,000 small-pox deaths 961 were in children under 10 years old, the total small-pox deaths having been 25,349, of which only 560 were in persons over 10. In Berlin, 1758-74 inclusive, of 6,705 small-pox deaths only 45 were over 15 years old (Edwardes). In Kilmarnock, from 1728 to 1764, of 622 small-pox deaths the age is recorded for all excepting 9, and only 12 were over 10 years old. The number under 5 years was 563. In Chester, in an epidemic in 1774, of 202 small-pox

deaths 180 were under 5 years old and the other 22 between 5 and 10 years. In Edinburgh, in 1746-83, in 1,185 small-pox deaths, 99 per cent. were under 10 years old. In 36,755 small-pox deaths at all ages in Kilmarnock, Edinburgh, Manchester, Warrington, Chester, Geneva, and The Hague, 17,252 were under 2 years of age.

CASE MORTALITY

Whatever the type of disease, small-pox is relatively very fatal in childhood, especially in early childhood, and has its lowest fatality rate in the age period 10 to 15 years, after which it rises again and is high throughout the whole of adult life.

Deaths from small-pox have been as few as 2 per cent. of attacks and as many as 40 per cent. Statistics of about 18,000 cases were collected by Dr. Jurin of the Royal Society, and partly by Scheuchzer, from 1723 to 1729. They show a case mortality rate of 16.5 per cent., but are of comparatively little value because no statement of ages is given. It is doubtful indeed whether they include any deaths under 2 years old. Of the total cases 5,742 belong to Boston in New England. Hirsch shows that small-pox was epidemic in Boston in 1690, 1702, and 1721. Jurin's figures would relate to the last of these epidemics, and looking to the intervals between the epidemics, the average age of those attacked in 1721 would be about 12 years. The Boston case mortality in Jurin's figures was 14.6 per cent., and appears to relate to a naturally resistant range of ages, so being likely to represent a fatality rate very considerably below the average. In the early part of the eighteenth century, however, before the days either of small-pox inoculation or of vaccination, the population was composed of the descendants of generations who had been able in great proportion to resist death by small-pox, and who hereditarily may have thus enjoyed a considerable degree of the same power of resistance. The only case mortality statistics which I have been able to find accompanied by a statement of ages relates to the village of Aynho, but considerations of space prevent their discussion here.¹

The connexion between epidemic periodicity, age incidence, and case mortality is obvious. Apart from vaccination, whatever the type of small-pox, the case mortality—or fatality—varies with the age of those attacked. But in an unprotected community very nearly all the susceptible were commonly attacked during the first epidemic after their birth. If the interval between epidemics was say twenty years, the average age of those infected would be higher than if the interval were shorter. After twenty years' interval very many of the cases would be at the very favourable age period of ten to fifteen years, while after a five or ten years' interval there would be hardly any at that favourable age who had evaded the disease at its previous visitation. In Kilmarnock

¹ See Stevenson and Murphy's *Hygiene*, vol. ii, p. 898. Churchill, 1893.

nine out of every ten victims of one epidemic had been born since the previous epidemic, and only one of seventy-nine persons killed by small-pox had safely passed through more than one epidemic. Thus the fatality varies with the age incidence, and in the absence of vaccination, the age incidence depends on the epidemic periodicity, so that statistics of fatality are of comparatively little value where neither age incidence nor epidemic periodicity are known. Vaccination, needless to say, cuts across all these relationships, and establishes a classification of its own in respect both of age incidence and case mortality rates.

[Monday Morning, August 11]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

THE HISTORY OF EPIDEMIOLOGICAL RESEARCH
DURING THE LAST SEVENTY YEARS

By W. H. HAMER, M.D.

SEVENTY years ago 'Health', as Sir John Simon said, 'began to take rank as an object of practical politics'. Chadwick had already, in 1838, become officially cognizant of 'the anarchy which was then prevailing instead of Public Health Law in England'; in a Report to the Poor Law Commissioners in the same year, Dr. Southwood Smith had urged, in connexion with excessive fever prevalence in London, 'the prevention of the evil rather than the mitigation of the consequences of it'; in the early forties the Select Committee on the Health of the Inhabitants of Large Towns presented its Report, and Mr. Chadwick's 'General Report on the Sanitary Condition of the Labouring Population of Great Britain' appeared; there followed in due course a series of Acts of Parliament, and at length the Public Health Act of 1848; it should be added that, in 1839, Mr. William Farr was appointed Compiler of Abstracts in the Registrar-General's Office, while in 1843 (exactly seventy years ago) Pasteur came of age and Robert Koch was born.

The cholera of 1848-9, which destroyed upwards of 50,000 persons in these islands, was doubtless the immediate cause stimulating 'Pater' to write to the *Lancet*, urging the formation of a Society having for its object the study of the behaviour of epidemic disease in general, and during the years then immediately succeeding it was the papers read before this Society, together with the Reports issued by the English Health Department, which constituted the main contributions to Epidemiographical literature. In the fifties this country was, indeed, generally regarded as the special home of this particular study, and, as Bulstrode in the Epidemiological Society's Commemoration Volume (prepared in 1900) reminded us, Hirsch recognized the value of the pioneer work done in London, when he prefixed to the first edition of his *Handbook of Geographical and Historical Pathology* an inscription dedicatory to the London Epidemiological Society.

While, however, the value of the work thus accomplished was duly

appreciated, much of that carried out in those early years in Europe and America was of a less ordered and systematic character. Indeed, Hirsch, in the preface to his second edition, tells how, in laying down twenty-five years previously (i. e. in 1856) the original plan of his great work, he felt himself confronted by two great difficulties—that in the first place of reducing to order ‘an almost unmanageable heap of materials’, and that, secondly, necessarily involved in ‘the founding according to a design, and the building up according to a system, of a discipline which had been the subject of but little labour before and had still to make good its right to a place among the medical sciences’. On reviewing, later, the progress made in twenty-five years, he observes (writing in 1881): ‘Medical Geography and the History of Diseases bears to-day a character quite different from that of the science twenty or thirty years ago. It has filled out in proportions and acquired finish to an extraordinary degree.’ So great, indeed, he adds, is the change that ‘what is needed now is an entirely new treatment of the subject’.

Another span of years—nearly a third of a century—has since these words were written passed away, and an even greater change than that chronicled in 1881 has come about; further filling out of proportions and a completer acquirement of finish there has been, but it may well be urged, again, that there is especially needed now ‘an entirely new treatment of the subject’—new as compared with that of the last thirty years, though it may, perchance, prove to represent in reality a return, in large measure, to the original discipline founded in the fifties and built up in the two succeeding decades by Hirsch.

In fact, thanks to Pasteur and Koch and their followers, a hitherto unknown planet has swum into the ken of watchers of the scientific sky, and this new bacteriology has threatened to perturb the movement of older planets and especially of that of epidemiology. Koch’s special technique and his formulation of his postulates date from the late seventies and early eighties, and in 1882 the tubercle bacillus was discovered. There followed in rapid succession the downfall of citadel after citadel immuring the secrets of the ætiology of disease at the sound of the bacteriological trumpets. To those who were working at bacteriology in the eighties, the old order seemed truly to be yielding place to new, as they reflected on the significance of the almost daily announcements of compliance of successive newly described organisms with Koch’s postulates. There followed of necessity vital modifications of epidemiological theory, with the addition to accepted doctrine of extra belief after extra belief,—‘Aberglaube invading’ and ‘Aberglaube re-invading’, as Matthew Arnold would have said. The old epidemiology, like the silk stockings of Sir John Cutler, was darned with worsted until so little of the original silk remained that no one could be sure that any of it was really left.

Now, however, the pendulum of opinion has begun to swing back again, and we are told on the best authority that ‘bacteriologists have outgrown Koch’s postulates as Koch himself outgrew them’. The

garments of bacteriology, in point of fact, are not now of rough postulate homespun, but are woven from extremely delicate serological and cultural materials, the most beautiful stuffs imaginable, though unfortunately possessed, so those who are disposed to be critical say, of a fatal quality of becoming thinned away almost to the point of invisibility. Study of some recently adduced instances of proof of causal relationship serves, indeed, only to remind those who are sceptical of Hans Andersen's story of 'The Emperor's New Clothes', which were 'cut out of the air with a huge pair of scissors and stitched with needles without any thread in them . . . and were light as a spider's web . . . one might think one had nothing on, but that was the very beauty of it'. The story tells how the opinion had been disseminated that the stuffs of which the clothes were made had 'the peculiar quality of becoming invisible to every person who was not fit for the office he held or who was impossibly dull'. It was not surprising, therefore, that when the Emperor 'had been duly robed and appeared in a procession, all the people round exclaimed, "How well his Majesty looks in his new clothes, and how becoming they are!" "But he has got nothing on," said a little child. The Emperor writhed, for he knew it was true, but he thought, "The procession must go on now;" so he held himself stiffer than ever, and the Chamberlains held up the invisible train.'

How far this allegory has application in respect of modern bacteriological principles and methods as applied to study of the ætiology of disease must be left for experts to determine; this is, however, certain, that the strenuous attempts made by bacteriologists to satisfy themselves that their science stands clothed and in its right mind have led to the casting of grave doubt upon first one and then another of the conclusions deduced from the employment of Hirsch's original discipline. How seriously the generally accepted doctrines of the 'eighties' have been challenged by the new science may be realized by comparing the teaching of thirty years ago, concerning, say, diphtheria or cerebro-spinal fever, with the bacteriological teaching of to-day; or by contrasting Murchison's beliefs concerning typhoid fever or cholera, or Hirsch's and Leichtenstern's beliefs concerning tuberculosis or influenza, with those of Koch and his followers. Amid all the turmoil of discussion and conflict of opinion the voice of epidemiology has been but little attended to; the sisters, bacteriology and statistics, have danced at the ball, epidemiology, like Cinderella, has crouched in the ashes gazing into the fire. But the study of Medical Geography and the History of Disease has throughout continued to manifest rapid progress. There has been an extension of the field of inquiry from America and Western Europe to the greater part of the world, and far greater precision has been attained by clearer and clearer recognition of the meaning of the terms dealt with. There has been, furthermore, patient examination of the influence of environment, of conditions of filth, overcrowding, dampness, and of unwholesome and infected water, milk, and food; and all this, with the corresponding development in

knowledge of parasitology, of protozoology, of filter passers, and of enzymes, and the recent demonstration of the mutability of bacilli, has now at length made it clear that reliance must be placed in increasing degree upon the original discipline as conceived and exploited by Hirsch.

All progress, it has been said, may be summed up in approaching a problem from first one and then another point of view, and finally putting together the experiences gained. Professor Edward Caird in dealing, in his little book on Hegel, with the 'Unity of Opposites', observes that 'the thinker who has fully seen into the correlativity of given opposites has reached a new attitude of thought in regard to them. They have become for him inseparable elements of a higher unity, which is now seen to be organic or vital. On the whole, thought is seen to be a process through certain phases, each of which necessitated the other, and by the unity of which it—the whole thought—is constituted. Nor does the movement stop here. The whole thought reached in this way has again its opposite or negative, which it at once excludes and involves, and the process may be repeated in regard to it, with the result of reaching a still higher unity, a more complete thought, in which it and its opposite are elements. And so on through ever widening sweeps of differentiation and integration, till the whole body of thought is seen in its organic unity and development—every fibre of it alive with relation to the whole in which it is a constituent element.'

On some such lines as these the problem of the ætiology of disease is now being approached, from opposed epidemiological and bacteriological sides, or again from what should be the calm and detached standpoint of the statistician. It is clear that the epidemiologists of a generation ago laid too great stress upon the 'symptom complex' and the 'gross macroscopical lesion'. We know now that in one and the same outbreak (epidemiologically speaking) typhoid and typhus symptom complexes, or diphtheria and scarlet fever symptom complexes, may present themselves. Again, we know that closely similar post-mortem appearances may be associated with typhoid or with paratyphoid bacilli, or again with bacillus tuberculosis or bacillus pseudotuberculosis. We know that, using the tests of a generation ago, epidemics were differentiated from one another which from our present standpoint should not be so differentiated, and recent study of the rôle played in disease by 'secondary invaders' possibly affords part of the explanation of the diverging theories in these instances. Then again, precise statistical methods have undoubtedly cleared up confusion in the older epidemiology, with regard for example to the exaggerated importance attached to effluvia from drains and sewers, or to the tendency to attribute all explosive outbreaks of typhoid to water.

So much for epidemiological theory when criticized by the bacteriologist or statistician. Now, turning to bacteriology, it is admitted that in numerous instances undue importance has been attached to one and another 'causal organism'. Even now, indeed, the question of the identity of the harmless *El Tor* and virulent cholera vibrios is discussed; while there

are those who are able to differentiate between a meningococcus isolated from a sporadic case of cerebro-spinal meningitis occurring in Seven Dials or the Old Kent Road, and a meningococcus from some continental city where the disease happens to be prevailing in epidemic form. A further case in point is that of the precise relation of the bacillus isolated from man and animals in the supposed plague of East Anglia, of 1910-11, to the common bacillus pseudo-tuberculosis rodentium. In all these instances from an epidemiological standpoint the phenomena are poles apart, and yet bacteriologically considered the approximation is wellnigh exact.

The old ideas concerning specificity are clearly undergoing change. It is strange to find how closely history repeats itself in this regard. Huxley, in speaking of his notions concerning the higher specific types, in which he was interested, in the fifties, said that not even Herbert Spencer's dialectic skill could drive him at that time from an agnostic position with regard to transmutation of forms. He took his stand, he says, upon two grounds, 'firstly that, up to that time, the evidence in favour of transmutation was wholly insufficient; and secondly that no suggestion respecting the causes of the transmutation assumed, which has been made, was in any way adequate to explain the phenomena'. Huxley's incredulity fell in face of the accumulating evidence, but then came Koch and imposed upon all a like incredulity with regard to the acceptance of transmutation in the lowest known forms of life. This in its turn is disappearing in face of the evidence—transmutation has been demonstrated to occur and bacteriologists are now setting to work to make inquiry concerning the causes of its occurrence.

A recent utterance (at the Washington Conference) from the Lister Institute illustrates the changed and changing point of view. Dr. J. Henderson Smith writes (*Centralblatt für Bakt.*, Orig.-Bd. lxxviii, Heft 2, p. 156): 'Variability is one of the characteristic properties of bacterial protoplasm and . . . systematic classification is likely to prove exceedingly complex.' Again (p. 162): 'By no system of classification can we bring the cultural and serological reactions of the dysentery bacilli into harmony'; and there follows (p. 164) a general discussion of difficulties arising from the fact that 'different parts of the same country rely on different criteria in establishing a diagnosis, and as a consequence neglect the tests in which they happen to place less faith'; and, finally, a plea is added for a minimum standard of requirements for diagnostic purposes, which 'need have nothing dogmatic about it, would not commit those who adopted it to a belief in the validity of all the tests it included, and would be subject to revision from time to time'. Acceptance of such a minimum standard perhaps necessarily carries with it entertainment of the suspicion that the arrows of the Philistines have found joints in the armour of the chosen bacteriological people. It is, moreover, interesting to note that this suspicion has been breathed in Washington—in the city whence came, a few years ago, the hog cholera investigations—and

published in Jena—the home of the outspoken *Centralblatt*—so that by the irony of fate the story may be said to have been told in the modern Gath and published in the streets of the modern Askelon.

It only remains now to refer to the discrepancies encountered when the results of the statistician come under review from the bacteriological and epidemiological standpoints. One explanation, here, may be the fact that acquirement of familiarity with the recondite methods of the statistician is so difficult of attainment as to absorb energies which the expert in other branches of knowledge devotes to study outside his own speciality ; only on some such hypothesis, indeed, can certain conclusions reached in the last few years find explanation.

At the present time, as Lord Haldane said the other day at Cambridge, ‘ we are face to face with new things. At the end of the Victorian period there were many who thought that the days of theology were over, that it was only a question of time for science to cover the whole ground. And now we had science called in question, and science itself was being subjected to a criticism which had cast a wholly new light upon it. . . . It was so in every department of human knowledge—the “obstinate questionings” of Wordsworth had extended thereto. And in science they saw the negative brought up against the old doctrine, which caused a halt, but only until a larger point of view had been reached, in which the negative was incorporated.’

The need of the time then, it was submitted, was that of a striving after a higher unity, and epidemiologically considered the lines upon which inquiry must proceed seemed to be as follows. *First*, the instability of bacteria must be admitted. The beautifully devised technique of Koch has caused it to be assumed that the behaviour of cultures on sterilized media represents the range of possibilities when germs escape into the outer world. It is strange to read Darwin’s chapters on variability in dogs or pigeons, and then turn to the demand made half a century later that we shall deny possibility of even minimal variation in a humble schizomycete. When we think, moreover, of the evolution of the human species, in, let us say, the last 3,600 years, how is it possible to doubt that certain changes may occur in so lowly a form as a bacillus in a far shorter period—say, for example, 3,600 seconds (one hour) ? In the first-named interval there have sprung in Western Europe from prehistoric man, employing his comparatively limited capacities over a relatively wide field of endeavour, highly specialized and differentiated types such as the modern experts in bacteriology and biometric science. So we find, according to Cohnheim, ‘ some bacteria which live on almost any organic material ’ ; as Pfeffer says, ‘ their enzymes must open almost every kind of lock.’ At the other end of the scale are bacteria whose enzymes can exercise only strictly limited activities. It is clearly arguable that while to change a flint-chipper into an opsonist admittedly requires centuries, the much simpler transmutation of a bacillus coli into a bacillus alcaligenes may be far more speedily accomplished.

Then in the *second* place, there must be recognition of the fact that although bacteria manifest marked instability, disease types, apart from undergoing the fluctuations known as major and minor waves, are determinedly persistent ; and this is true not only of ' non-bacterial ' diseases such as smallpox and measles, but of plague, typhus, and influenza. In explanation of this persistence it is necessary, therefore, to travel outside the domain of bacteriology, and of late years there has been a disposition to assume that a final resting-place has been found in enzymes. Sir Wm. Whitla, in a recent address, referred to E. J. Lewis's variant upon the old Greek conception that ' the world is supported by Atlas, Atlas is supported by a tortoise, whilst Chelonia Graeca itself is resting upon fair weather '. For fair weather E. J. Lewis has ' playfully suggested ' the substitution of enzymes, and Sir Wm. Whitla, in his turn, half seriously claims that enzymes are resting ' upon the solid foundations of chemistry '. This method of figuring out causal relationships is far from satisfying. Even on a gravitational basis, moreover, it may be remarked that the world which supports us revolves in an orbit about the sun, and it may be that the laws of enzymes and their relation to chemistry need to be resolved under a higher unity, perhaps by some such discovery as that by which Newton showed that the falling apple and the revolving planet obey the same law. The vertical lines of superposition seem to fail us altogether, moreover, in dealing with enzymes, for we have to admit the reversibility of enzyme action. We seem in fact in examining such action to be, as it were, at the perihelion of some comet, where approach becomes converted into recession ; and it may be that, at such a point, laws which are not those of ordinary chemistry operate, and that the living and the lifeless are only mutually convertible under these special conditions.

In the *third* place, parasitology and especially the new protozoology have made evident to us the need of being on the look-out for intermediate hosts. And here, curiously enough, we may note that with this enlargement of our ideas there has coincidently (owing largely no doubt to the extravagant cult of the bacillus) been a narrowing of point of view as regards acceptance of ordinary aerial transmission of the excitants of disease. It is, indeed, strange that a generation of students of preventive medicine which is disposed to regard somewhat critically Sir Wm. Power's investigations concerning aerial spread of small-pox, should have grown up side by side with a generation of physicists who look with favour upon Arrhenius's hypothesis with regard to the possibility of forms of life traversing interstellar space.

Lastly, laying to heart the advice given in the old play ' to get back to our sheep ', the desirability may be urged of betaking ourselves with renewed energy to cultivation of Hirsch's ' discipline ', with the object of ' further filling out its proportions and giving it more complete finish '.

[Monday Morning, August 11]

SECTION XXIII HISTORY OF MEDICINE

INDEPENDENT PAPER

FIGURES MÉDICO-ASTROLOGIQUES DES NEUVIÈME, DIXIÈME ET ONZIÈME SIÈCLES

PAR M. LE DR. WICKERSHEIMER

EN examinant les manuscrits antérieurs au XII^e siècle conservés dans les bibliothèques publiques de France, j'ai rencontré plusieurs figures médico-astrologiques qu'il m'a paru intéressant de réunir.

I. MACROCOSME ET MICROCOSME

Les analogies entre le macrocosme et le microcosme dominés tous deux par quatre qualités, le chaud et le froid, le sec et l'humide, entre le monde, l'année et l'homme (quatre éléments, quatre saisons et quatre humeurs, et aussi quatre tempéraments, quatre âges, quatre points cardinaux et quatre vents) ont été figurées durant tout le moyen âge par des schémas plus ou moins ingénieux ; voici ceux de ces schémas que j'ai rencontrés dans les manuscrits antérieurs au XII^e siècle.

TYPE N^o 1. — Se rencontre dans le manuscrit latin 5543 de la Bibliothèque Nationale qui date du IX^e siècle. Au feuillet 136, cercle montrant comment les quatre éléments, les quatre saisons et les quatre humeurs sont déterminés par les quatre qualités. L'air, le printemps et le sang sont chauds et humides, le feu, l'été et la bile sont chauds et secs, etc. Schéma identique aux feuillets 85 et 95 du manuscrit nouv. acq. lat. 1618 de la Bibliothèque Nationale, écrit au XI^e siècle ; ce manuscrit a été volé à la Bibliothèque Municipale de Dijon par Libri qui, dans un but frauduleux, y fit tracer l'ex-libris d'un couvent de Pérouse.¹ Le manuscrit lat. 12999 de la Bibliothèque Nationale, du XII^e siècle, nous montre au feuillet 7 une figure analogue.

TYPE N^o 2. — Manuscrit n^o 448 de la Bibliothèque Municipale de Dijon, manuscrit du X^e siècle qui provient de l'Abbaye de Saint-Bénigne de Dijon. Au feuillet 73, deux cercles ; dans l'un les quatre saisons sont comparées aux quatre âges de la vie ; dans l'autre, les quatre qualités, les quatre éléments, les quatre âges et les quatre humeurs sont rapprochés.

TYPE N^o 3. — Dijon, même manuscrit. Au feuillet 80 figure analogue, rapprochant les quatre qualités, les quatre éléments, les quatre humeurs et les quatre âges. Tout autour sont représentés les quatre vents sous la forme d'hommes barbus, nus, soufflant chacun dans deux trompettes ; ils ne sont pas désignés par leur nom.

¹ Léopold Delisle, Bibliothèque Nationale, *Catalogue des manuscrits des fonds Libri et Barrois*, Paris, H. Champion, 1888, in-8°, p. 88.

TYPE n° 4. — Manuscrit n° 184 de la Bibliothèque Municipale de Poitiers, x^e ou xi^e siècle. Au feuillet 68 verso cercles concentriques divisés en quatre quartiers par deux lignes qui se croisent perpendiculairement au niveau du centre commun. Les quatre points cardinaux, les quatre éléments, les quatre saisons et les quatre humeurs sont répartis entre ces quatre quartiers avec l'indication de leurs qualités respectives.

TYPE n° 5. — Manuscrit n° 62 de la Bibliothèque Municipale de Chartres, manuscrit du x^e siècle qui provient du chapitre de la Cathédrale de Chartres et non de l'Abbaye de Saint-Père, comme il est dit dans le catalogue imprimé.¹ La figure qui occupe tout le verso du feuillet 37 rapproche les quatre points cardinaux, les quatre éléments, les quatre saisons, les quatre humeurs et les quatre âges. Elle diffère surtout des précédentes par les notes détaillées qui couvrent ses marges et où se trouvent énumérés les caractères et les effets des vents.

II. LES SIGNES DU ZODIAQUE ET LE CORPS HUMAIN

Bouché-Leclercq a exposé très clairement le principe bien connu de la mélothésie zodiacale, dont l'invention a été attribuée par les uns aux Égyptiens, par les autres aux Chaldéens. La règle 'consiste à étendre pour ainsi dire le corps humain sur le cercle déroulé du Zodiaque, en faisant poser la tête sur le Bélier (le Bélier, tête du monde) et les pieds sur les Poissons, qui, eux, n'ont pas de pieds mais compensent cette fâcheuse inaptitude par le fait qu'ils sont deux.'² Le Bélier gouverne donc la tête ; le Taureau, le cou ; les Gémeaux, les membres supérieurs ; le Cancer, la poitrine ; le Lion, l'estomac et le cœur ; la Vierge, le ventre ou les entrailles ; la Balance, la région lombaire ; le Scorpion, les parties honteuses et le fondement ; le Sagittaire, les cuisses ; le Capricorne, les genoux ; le Verseau, les jambes ; les Poissons, les pieds.

Le plus expressif des schémas destinés à figurer les influences des douze signes du Zodiaque sur les douze régions du corps, orne encore aujourd'hui les almanachs populaires des États-Unis d'Amérique.³ C'est un type bien connu. Un homme nu se tient debout, les jambes écartées et les bras étendus ; il arrive que le corps soit représenté intact, il arrive aussi que le buste soit largement fendu, afin de découvrir les organes internes. Tantôt les signes du Zodiaque sont dessinés sur le corps même, tantôt ils sont figurés à la marge et reliés par des traits aux parties du corps qu'ils gouvernent. Ces figures renseignent immédiatement sur l'opportunité des saignées, puisqu'il ne faut pas toucher avec le fer un membre quelconque pendant que la Lune occupe le signe correspondant : *Μὴ ἄψῃ μορίου σιδήρω τῆς Σελήνης ἐπεχούσης τὸ ζῶδιον ὃ κυριεύει τοῦ μορίου ἐκείνου*.⁴ Elles ont reçu des Allemands un nom dont il n'existe pas

¹ *Catalogue général des manuscrits des bibliothèques publiques de France : Départements*, xi (1890), in-8°, p. 30.

² A. Bouché-Leclercq, *L'astrologie grecque*, Paris, E. Leroux, 1899, in-8°, p. 319.

³ Ernest Wickersheimer, 'La médecine astrologique dans les almanachs populaires du xx^e siècle,' *Bulletin de la Société française d'histoire de la médecine*, x (1911), pp. 26-39, 2 figs.

⁴ Ps. Ptolémée, *Centiloq.*, 20. Bouché-Leclercq., op. cit., p. 523.

d'équivalent en français ; elles ont été appelées *Aderlassmann* (homme de la saignée).

Dès le ^{xiv}e siècle les *Aderlassmann* sont assez fréquents dans les manuscrits. Je ne sais si l'on en connaît de plus anciens ; quoique il en soit, je n'en ai pas rencontrés dans les manuscrits des bibliothèques publiques de France antérieurs au ^{xiii}e siècle. En revanche, dans le manuscrit latin 7028 de la Bibliothèque Nationale, qui a été écrit au ^{xi}e siècle, et qui a appartenu à Saint-Hilaire le Grand de Poitiers, j'ai trouvé au feuillet 154 la jolie figure que voici.

Aux quatre angles, quatre personnages à mi-corps dont les attributs symbolisent les quatre saisons. Au centre le Christ à mi-corps, la main droite levée pour bénir. Autour de lui les douze signes du Zodiaque, avec leurs noms et ceux des parties du corps qu'ils gouvernent. Légende : 'Secundum philosophorum deliramenta notantur duodecim signa ita. Ab Ariete incipiamus. Hec omnia signa sunt corporis hominis et signa sunt Solis in celo apparentis.'

III. LA SPHÈRE DE PETOSIRIS

L'astrologue Petosiris serait, suivant la tradition, l'auteur de cette figure qu'il aurait dédiée à Nechepso, roi d'Égypte ou d'Assyrie.

Nechepso le Saïte régna en effet sur l'Égypte de 677 à 671 avant Jésus-Christ, mais la sphère de Petosiris est beaucoup moins ancienne. Elle appartient au ⁱer siècle avant Jésus-Christ d'après Ernst Riess, au ⁱⁱe siècle avant Jésus-Christ d'après W. Kroll, au ⁱer siècle après Jésus-Christ d'après Franz Boll. Les principaux travaux consacrés à l'étude de ses origines ont été indiqués par Karl Sudhoff au bas des pages 4-6 de ses *Iatromathematiker*.¹

Comme l'a fait remarquer Bouché-Leclercq, cet 'instrument de divination paraît être fait pour des gens qui ne tiennent pas à guérir un malade, mais à savoir s'il mourra ou non, et bientôt ou non'.² Il peut servir aussi à prévoir l'issue d'un combat de gladiateurs, à renseigner sur les chances de rattraper un esclave fugitif, etc.

S'il s'agit d'établir le pronostic d'une maladie, on additionne les chiffres correspondant aux lettres de l'alphabet qui forment le nom du malade (on se souvient que dans l'alphabet grec chaque lettre représente un chiffre), et à la somme ainsi obtenue on ajoute le chiffre correspondant au jour de la Lune où le malade a pris le lit, ce chiffre étant fourni d'ailleurs par un tableau. On divise la somme totale par 29, moyenne entre les diverses façons d'estimer la durée de la révolution lunaire, puis on cherche dans lequel des six compartiments de la sphère (ou cercle) est le chiffre équivalent au reste obtenu. La moitié supérieure de la sphère est celle de la vie ; elle est divisée en trois compartiments : μεγάλη ζωή,

¹ Karl Sudhoff, *Iatromathematiker vornehmlich im 15. und 16. Jahrhundert*, Breslau, J. H. Kern, 1902 (*Abhandlungen zur Geschichte der Medizin*, ii).

² Bouché-Leclercq, op. cit., p. 537.

μέση ζωή, μικρά ζωή. Si le chiffre cherché est dans le premier compartiment, la guérison sera rapide, plus lente s'il est dans le second, plus lente encore s'il est dans le troisième. La moitié inférieure, celle de la mort, est également divisée en trois compartiments : μέγας θάνατος, μέσος θάνατος, μικρός θάνατος. La mort surviendra tôt si le chiffre cherché est dans le premier compartiment, elle se fera attendre s'il est dans le second, et sera plus tardive encore s'il est dans le troisième.

On peut se servir de la sphère de Petosiris d'une autre façon, en opérant à part sur le nom du client et sur le nombre de la Lune. Si le nombre de la Lune se trouve dans l'hémisphère supérieur et le nom de l'homme dans l'hémisphère inférieur, l'homme sera en danger, mais il en échappera. Si le nom de l'homme est dans l'hémisphère supérieur et le nombre de la Lune dans l'hémisphère inférieur, il arrivera des malheurs sous l'apparence de la prospérité. Si l'un et l'autre se trouvent dans l'hémisphère supérieur, bonheur ; si l'un et l'autre se trouvent dans l'hémisphère inférieur, malheur.

La sphère de Petosiris a été souvent rencontrée dans les manuscrits grecs, et c'est d'après des manuscrits grecs qu'elle a été publiée par Berthelot¹ et par Bouché-Leclercq.²

Une version latine de l'explication relative à la manière de se servir de la sphère a été publiée par Ernst Riess, d'après un manuscrit du ix^e ou du x^e siècle de la Laurentienne de Florence (Cod. Laur. xxxviii. 24, f^o 174 v^o).³ J'en ai trouvé une seconde copie dans le manuscrit latin 17868 de la Bibliothèque Nationale de Paris, manuscrit du x^e siècle, qui provient de l'ancienne bibliothèque du chapitre de Notre-Dame de Paris. Elle y est suivie de deux tableaux indiquant en chiffres la valeur des jours lunaires et celle des lettres de l'alphabet grec ; ces deux tableaux manquent dans le manuscrit de Florence. En raison de sa rareté, il m'a paru intéressant de la reproduire ici :

(Fol. 13) 'Incipit epistola Phetosiri de sphaera.

'Phethosiris Nechepso regi salutem. De his quæ a me ad humanæ vitæ cautelam inventa sunt unumquodque mittem me tibi non piguit. Superest ut tu in his per inspiratam tibi divinitus prudentiam, operando laborem impendas, certus quod decumbentium vel fugitivorum, vel monomachorum, vel aliorum similium eventibus non fallacem poteris capere prescientiam. Si argumentum regulare quod huic scripturæ subieci, diligenter inspexeris, consulturus igitur sic facito. Sume nomen vel decumbentis, vel de fuga lapsi, vel depugnaturi, vel alterius cuiuslibet de quo inquiris et collige numerum eius. Deinde lunam considera quota fuerit ea die qua vel eger decubuit, vel fugitivus elapsus est vel quota fu(Fol. 13 verso)tura sit, cum monomachus depugnaturus est, et cetera huiusmodi, numerumque regularem qui ei lune adscriptus est

¹ Berthelot, *Collection des anciens alchimistes grecs*, i (Introduction), pp. 87 et suiv.

² Bouché-Leclercq, op. cit., pp. 539-40.

³ Ernestus Riess, 'Nechepsonis et Petosiridis fragmenta magica,' *Philologus*, Suppl. VI (1891-3), pp. 382-3.

numero nominis adiunge. Tum summam quæ ex his conficitur per XXVIII divide, et numerum qui superfuerit collige, inspectaque figura quo in loco idem numerus sit positus inquire. Si eum inveneris in zoe megale et de egro agitur, cito convalescet ; si de fugitivo cito revertetur ; si de gladiatore vincet. Si autem in mesi zoe omnia hæc difficiliter evenient. Si autem in zoe micra, licet prosperum, difficilem tamen sunt exitum habitura. Quod si in eo loco fuerit tanatos megas, inscriptus eger post longam infirmitatem morietur, fugitivus diu quesitus non invenietur, gladiator, difficile tamen, superabitur. Eadem in meso thanatho celeriora fiunt et in microthanatho celerrima. Ponatur exempli gratia pugna Hectoris et Achillis. Luna erat XVII, quæ habet numerum regularem DCCCXCIII, Achillei nomen habet MCCLXXVI, qui simul iuncti fiunt ÎCLXVIII ; hos partire per XX et VIII, et quod superfuerit, id est XXIII, quere in forma regulari et invenies illud in eo loco ubi scribitur ζοη μικραλη. Si idem de Hectore feceris invenies residuum numerum in μικρω θαναθω, quæ positio numerorum victorem Achillem et Hectorem victum, absque ambiguitate significat. Item est et alius modus. Si numerus lunæ fuerit in ypogio ¹ et numerus hominis in ypergio, sub specie prosperorum adversa contingent, at vero si uterque numerus, videlicet hac lunæ supra horizontem fuerit inventus, procul dubio prospera pollicentur ; item si infra horizontem ambos esse constiterit, adversa omnia provenient. Explicit.

‘Luna I, MLXXXVIII. Luna II, MCXVI. Luna III, ÎCXVIII. Luna IIII, CCCXV. Luna V, DCCCXVIII. Luna VI, DCXXIII. Luna VII, CCCIIII. Luna VIII, DCCCLVI. Luna VIII, DCLI. Luna X, DXXXVIII. Luna XI, DXCH. Luna XII, ÎCCCCXLI. Luna XIII, ÎDCCCLXXX. Luna XIII, ÎDCLXXXIII. Luna XV, ÎCX. Luna XVI, DXXXV. Luna XVII, DCCCXCIII. Luna XVIII, ÎDCXCVII. Luna XVIII, DCXVIII. Luna XX, ÎDLXVI. Luna XXI, ÎXXXVIII. Luna XXII, ÎDLXVI. Luna XXIII, ÎCCCCXVIII. Luna XXIII, ÎDCCCLXI. Luna XXV, ÎCCLXIII. Luna XXVI, ÎCIII. Luna XXVII, DCCCLXXX. Luna XXVIII, DCCCCLXVI. Luna XXVIII, ÎCXV.

‘Numerus litterarum grecarum. A, I. B, II. Γ, III. Δ, IIII. E, V. ς, VI. Ζ, VII. Η, VIII. Θ, VIIII. Ι, X. Κ, XX. Λ, XXX. Μ, XL. Ν, L. Ξ, LX. Ο, LXX. Π, LXXX. ς, XC. Ρ, C. C, CC. Τ, CCC. [Υ, CCCC.] Φ, D. Χ, DC. Ψ, DCC. Ω, DCCC. ς, DCCCC. ω, Î.’

La légende explicative de la sphère de Petosiris se rencontre sans nom d’auteur et sans titre dans le manuscrit latin 7418 de la Bibliothèque Nationale de Paris (f^{os} 91 vo-92), qui date du xiv^e siècle. Elle est

¹ Le manuscrit porte ‘ypergio’. Cette dernière partie a été dénaturée par le copiste. Le texte publié par Riess est plus correct : ‘Est et alius modus. Si numerus lunæ fuerit in *υπογίω* et numerus hominis in ypergio, periclitabitur quidem homo, evadet tamen et e contra, si hominis numerus in ypogio, lunæ vero fuerit in ypergio, sub specie prosperorum adversa contingent. At vero si uterque...

accompagnée d'une figure rectangulaire. Le nombre diviseur est 24 au lieu de 29, sans doute par suite d'une erreur du copiste, et certains nombres des jours lunaires (au nombre de 30) différent de ceux qui viennent d'être donnés.

IV. LA SPHÈRE D'APULÉE OU SPHÈRE DE PYTHAGORE

Ne dérive point de la sphère de Petosiris mais d'une autre figure grecque que l'on rencontre dans le papyrus de Leyde et qui a été décrite par Bouché-Leclercq¹ d'après Berthelot² et Dieterich³.

Dans ce papyrus, bien que portant le nom de sphère, elle se présente sous la forme d'un rectangle qui contient les 30 jours du mois rangés en trois colonnes et en ordre mystique, 18 dans la partie supérieure, 12 dans la partie inférieure. En voici le mode d'emploi : 'Sphère de Démocrite, pronostic de vie et de mort. Sache sous quelle lune le malade s'est alité et le nom de sa nativité. Ajoute le calcul de la Lune et vois combien il y a de fois trente jours : prends le reste et cherche dans la sphère. Si le nombre tombe dans la partie supérieure, il vivra, si c'est dans la partie inférieure il mourra.' C'est l'addition de la valeur numérique du nom donné à la naissance (le prénom chez les Romains) au quantième et division par 30. Ce diviseur 30 correspond à une Lune fictive, tandis que les auteurs du cercle de Petosiris avaient adopté 29, moyenne entre les diverses façons d'estimer la durée de la révolution de la Lune. On chercha à mettre d'accord la sphère de Démocrite avec l'alphabet latin ; ici les lettres ne représentant plus toutes des nombres comme celles de l'alphabet grec, il fallut attribuer une valeur numérique arbitraire aux lettres de l'alphabet latin.

J'ai trouvé la sphère de Démocrite latinisée dans deux manuscrits latins de la Bibliothèque Nationale de Paris et dans un manuscrit de la Bibliothèque Municipale d'Orléans, tous trois antérieurs au XII^e siècle. Dans les deux premiers elle porte le nom d'Apulée ou les deux noms d'Apulée et de Pythagore, dans le troisième elle est anonyme.

1^o *Bibl. Nat., nouv. acq. lat.* 1616. IX^e siècle.—A appartenu à l'Abbaye de Saint-Benoît-sur-Loire ou de Fleury, puis à la Bibliothèque Municipale d'Orléans ; il avait été volé dans ce dernier établissement par Libri qui, dans un but frauduleux, avait fait inscrire au f^o 14 v^o cette mention 'Sancte Justine de Padua'.⁴

Figure et légende au verso du feuillet 7 du manuscrit :

'Ratio speræ Pthagor philosophi quod Epulegus descripsit ut de quacunque re scire volueris consulere, ut puto, de egris qua die incurrerit et ea die quota sit luna, addes et numerum literarum nominis ipsius

¹ A. Bouché-Leclercq, op. cit., p. 538.

² Berthelot, op. cit., pp. 86-8.

³ Dieterich, 'Papyrus magica musei Lugd. Bat,' *Jahrbuch f. kl. Phil.*, Suppl. xvi (1888), pp. 813-14.

⁴ Léopold Delisle, *Catalogue des manuscrits des fonds Libri et Barrois*, Paris, H. Champion, 1888, p. 78.

secundum numerum pronuncians. De preliantibus, sic faci: amplius adest dierum vel orarum unaquaque die vel quota ora, si quis fuerit preliatus et numerus in unum congregabis et partire in XXX^{ma} et require in spera, si sursum vincit, si autem infra vincitur. Si Saturnus pones XXVII, si Solis XIII, si Luna XVII, si Martis XV, si Mercurius XXV, si Iovis XI, si Veneris XV. A, III. B, III. C, XXVII. D, XXVI. E, XV. F, III. G, VII. H, III. I, XV. K, XV. L, XXI. M, XXIII. N, XV. O, VIII. P, XVII. Q, XXI. R, XIII. S, VIII. T, VIII. V, VI. X, VI. Y, III. Z, II.'

On remarquera que les nombres des jours lunaires ne sont pas donnés ici, et que pour le pronostic d'un combat la manière de procéder est plus compliquée que s'il s'agit de prédire l'issue d'une maladie; l'influence des sept astres qui président aux sept jours de la semaine est alors à considérer.

2^o *Bibl. Nat., lat. 8663. XI^e siècle.* — Provient de la bibliothèque de Philibert de La Mare, conseiller au Parlement de Bourgogne, mort en 1687; on peut supposer qu'il est d'origine bourguignonne. Figure et légende au verso du feuillet 57 du manuscrit:

'Sphera Apulegii de egris vel monomachis. Si vis scire qua die decumbant vel liberentur, summe nomen egri per litteras, et numerum earum adtende, et adde lunam illi diei qua eger decumbuit et feriam, et dum hoc feceris, collige totum numerum, dividens per XXX, et quod remanet infra adscriptum conspice, etsi supra fuerit, vitam vel victoriam, si infra mortem vel casum monomachi monstrabit.'

3^o *Orléans 276. XI^e siècle.* — Provient de l'Abbaye de Saint-Benoît-sur-Loire (ou de Fleury) comme le manuscrit nouv. acq. lat. 1616 de la Bibliothèque Nationale de Paris, précédemment cité. Pas de légende explicative. Page 129 du manuscrit.

Des figures plus ou moins semblables à celles qui viennent d'être décrites se rencontrent dans des manuscrits moins anciens de la Bibliothèque Nationale de Paris: *Spera Pytagore* (lat. 12999, f^o 7 v^o, XII^e siècle); *Spera Pietagore quam Apuleius descripsit* (lat. 7418, f^o 93, XIV^e siècle). Le manuscrit latin 7337 qui a été écrit au XV^e siècle présente (pp. 175 à 177) des figures analogues. Deux seulement sont circulaires; les trois autres, bien qu'en forme de rectangle, portent les noms de *Spera Pietagore*, de *Spera Apulegii Platonici* et de *Spera Satetici*.

V. LE TÉTRAGONE SUJET

Le tétragone sujet (*Tetragonus subjectus*) ne diffère que fort peu de la sphère de Petosiris et de celle d'Apulée ou de Pythagore. Par certains traits il rappelle davantage la première, par d'autres la seconde et semble ainsi résulter d'une combinaison de ces deux figures.

Comme son nom l'indique, c'est un quadrilatère. Il est divisé en deux moitiés, l'une supérieure, l'autre inférieure, et chacune de ces moitiés est elle-même divisée en trois compartiments. Les trois compartiments

supérieurs renferment chacun six jours du mois, les trois compartiments inférieurs renferment chacun quatre jours. On ajoute le chiffre de l'âge qu'avait la Lune le jour où le malade s'est alité à la somme des chiffres correspondant aux lettres du nom du malade et on divise la somme totale par 30. Si le chiffre ainsi obtenu se trouve dans le compartiment du milieu de la moitié supérieure, la guérison sera prochaine ; s'il se trouve dans l'un des compartiments latéraux de la même moitié, le malade guérira, mais lentement. Si le chiffre occupe le compartiment du milieu de la moitié inférieure, la mort surviendra rapidement ; elle se fera attendre si le chiffre occupe l'un des compartiments latéraux de cette moitié.

J'ai trouvé le tétragone sujet avec les indications relatives à la manière de s'en servir et un tableau donnant la valeur en chiffres des lettres de l'alphabet latin, dans deux manuscrits antérieurs au XII^e siècle. Dans l'un il est attribué à Pythagore, dans l'autre il est anonyme.

1^o *Bibl. Nat., nouv. acq. lat.* 1616. IX^e siècle. — Ce manuscrit contient aussi une sphère d'Apulée et j'ai parlé plus haut de sa provenance. Figure et légende au feuillet 14 du manuscrit :

'Si nosse vis de quolibet infirmo in quacumque infirmitate detentus fuerit, si vivere debeat an mori, ita exploret. Disce prius etatem lunæ ipsius diei in qua quis decubuit, item nomen decumbentis secundum numerum literarum scribe, insuper numerum eisdem literis subpositum in alphabeto subiunge et sic in unum collige et partire per XXX, et quicquid remanserit respice in quadrano subiecto. Quod si inveneris in superiori parte in media linea eger cito convalescat, si vero in lateralibus lineis invenies tarde convalescet. Quod si in inferiori parte perspexeris et inibi inveneris in medio tramitte, eger cito peribit. Si autem in lateralibus idem in dextera aut sinistra infirmus longa egritudine afflictus morietur.

'Sic et de quibuslibet aliis causis commodis sic consulere volueris reperies. Ratio Pitageræ de infirmis sive de quacunque causa volueris scire ut si infauste sive feli[c]iter eveniat, cognoscas. Hæc est.'

[A la marge :]

'A, III. B, III. C, XXV. D, XXIII. E, XV. F, III. G, VII. H, VI. I, XV. K, XV. L, XX. M, XXV. N, XV. O, VIII. P, XIII. Q, XXI. R, XIII. S, VIII. T, VIII. V, V. X, VI. Y, III. Z, III.'

2^o *Laon* 407. IX^e siècle. A appartenu au chapitre de Notre-Dame de Laon.

(Fol. 136 v) 'De tetragono subiecto.

'Si nosse vis de quolibet in quacumque infirmitate detentus fuerit, si vivere debeat an mori, ita explora. Disce prius ætatem lunæ ipsius diei in qua quis discumbit. Item nomen decumbentis secundum numerum litterarum scribe. Insuper numerum litteras eisdem subpositum in alphabeto subiunge et sic in unum collige et partire per XXX, et quicquid remanserit respice in quadram subiecto, quod si inveneris in superiori

parte in media linea, eger cito convalescet, si vero in lateralibus lineis inveneris, tarde convalescet. Quod si in inferiora parte perspexeris, et inibi inveneris in medio tramite, eger cito peribit. Si autem in lateralibus, id est in dextera parte aut in sinistra inveneris, infirmus longa egritudine afflictus morietur.

‘Sic et de quibuslibet aliis causis, commodis et incommodis, si consulere volueris reperies.’

[A la marge:]

‘A, III. B, III. C, XXV. D, XXIII. E, XV. F, III. G, VII. H, VI. I, XV. K, XV. L, XX. M, XXVI. N, XV. O, VIII. P, XIII. Q, XXI. R, XIII. S, VIII. T, VIII. V, V. X, VI. Y, III. Z, III.’

La figure occupe le recto du feuillet 137 du manuscrit.

On remarquera que dans les deux tableaux la valeur en chiffre des lettres de l’alphabet est donnée de façon identique, sauf pour la lettre M, erreur de transcription certaine. Beaucoup de ressemblance aussi avec le tableau qui accompagne la sphère d’Apulée ou de Pythagore, dans le manuscrit nouv. acq. lat. 1616 de la Bibliothèque Nationale.

Le manuscrit latin 7418 de la Bibliothèque Nationale écrit au XIV^e siècle contient (f^o 92 v^o) une explication relative à un tétragone parent des précédents et qui s’y trouve attribué à Pythagore ou à Craton, ‘Pictagore sive Cratonis.’

VI. LES TROIS FIGURES DU MANUSCRIT LAT. 17868 DE LA BIBLIOTHÈQUE NATIONALE

Les figures qu’il nous reste à examiner sont tirées du manuscrit latin 17868 de la Bibliothèque Nationale. Ce manuscrit, dont il a été question plus haut à propos de la sphère de Petosiris, date du x^e siècle et provient de la bibliothèque du chapitre de Notre-Dame de Paris. Les trois figures qui nous intéressent occupent le verso du feuillet 16 du manuscrit, où l’on voit aussi une figure astronomique ; nous n’avons pas à nous occuper de celle-ci. Il m’a été impossible de déterminer leur mode d’emploi, mais comme elles ont eu, selon toutes probabilités, des applications médicales, j’ai tenu à en donner une brève description.

FIGURE I^{er}. — Rectangle allongé verticalement, dans lequel sont rangés quatre par quatre, 40 cercles dont les 37 premiers portent en leur centre une lettre de l’alphabet latin, P.L.S.L.L.N..., etc. ; les espaces laissés libres par les cercles portent également une lettre de l’alphabet. Sur le cadre les inscriptions que voici. En haut : ‘Hic requiescunt multitudo viventium et fortitudo gaudentium.’ En bas : ‘Hic requiescit multitudo morientium et fortitudo dolentium.’ A gauche : ‘Spera hec bonum malumve discernens et sicut discerpsimus incoatione secli principii, de gaudio luctu, de luctu dolore, de dolore ardore +’ A droite : ‘+ De ardore

tremore, de tremore metu, de metu morte et carcere, de carcere redemptione, de redemptione resurrectionem vitæ.' On distingue facilement dans cette légende l'empreinte du christianisme.

FIGURE II. — Cercle ; au centre une rose, à la circonférence des lettres capitales dont je cite les premières et les dernières :

'MOPOTNUSNEBAQVSPIRAPAXPANSANLEOLV
X... MOROMOCUTANGO.'

Le cercle est divisé en 30 segments, où sont répartis 3 par 3 des lettres capitales et où l'on lit des inscriptions du genre de celles-ci :

'Duo sunt qui omnia continent mundi.—Duo sunt qui omni tempore gaudio magno iocundant.—Duo sunt qui cotidie florescunt set unus obscurat.—Duo sunt qui in suo tempore tempora non conualescit.'

FIGURE III. — Cercle ; au centre une rose, à la circonférence deux alphabets latins dont chaque lettre est rapprochée d'un chiffre. La même valeur n'est pas attribuée aux lettres dans l'un et l'autre alphabet ; dans l'une les valeurs des lettres ressemblent beaucoup à celles qui sont exprimées dans les légendes accompagnant la sphère d'Apulée et le tétragone sujet.

Le cercle est divisé en douze segments correspondant aux douze signes du Zodiaque : 'Aries, Taurus, Gemini, Cancer..., etc.' Chacun de ces segments est divisé lui-même, soit en deux, soit en trois segments plus petits, qui portent chacun le nom arabe de l'une des mansions de la Lune et la figure des étoiles qui déterminent cette mansion : 'Alnath, Albotain, Aldarai, Aldebarai, Almisen... etc.' Il y a 28 mansions lunaires, mais la figure n'en indique que 27, la 24^e 'Scaldoch' ayant été omise par le scribe qui traça les figures. Les noms des 28 mansions lunaires sont d'ailleurs répétés sous une forme presque semblable en plusieurs endroits du manuscrit.

(f^o 5) 'Hæc sunt nomina XX^{ti} VIII^{to} mansionum. Aries habet mansiones Alnait et Aldraia atque terciam partem Albotaim . . . Hæc de XX signorum mansionibus siriaze temulenta nomina sic transtulit latina sollertia . . .'

(f^o 14 verso) 'Hæc sunt nomina XXVIII mansionum lunæ per quas ætiam omnes planetæ cursum peragunt, suntque divisa per XII signa quæ Sarraceni nuncupant ita . . .'

Ce qui fait l'intérêt de cette dernière figure et du manuscrit dont elle est tirée, c'est qu'elle nous montre les traces d'une influence arabe, s'exerçant dans la science occidentale, à une époque où de pareilles traces sont rares et difficiles à relever. Les mots arabes (et aussi les mots hébreux) abondent dans le 'Liber Alchandreï Philosophi' et dans le 'Liber Regi Macedonum Alexandro Argafalai nacione Caldei', traités astrologiques dont il serait intéressant de déterminer les auteurs et qui forment les deux parties principales du manuscrit latin 17868 de la Bibliothèque Nationale. Ce manuscrit qui provient, nous l'avons vu, de la Bibliothèque du chapitre de Notre-Dame de Paris, qui a dû servir à l'enseignement dispensé dans les écoles du chapitre, n'est pas daté, mais il

présente tous les caractères de l'écriture du x^e siècle, et c'est à cette époque que le fait remonter M. Léopold Delisle¹. Il est donc contemporain du moine Gerbert qui, en devenant pape, prit le nom de Sylvestre II, c'est-à-dire de l'un des premiers Occidentaux que l'on suppose avoir profité des leçons de l'Orient.

Le fait me paraît digne d'être signalé, car, ayant examiné dans les bibliothèques publiques de France les manuscrits antérieurs au XII^e siècle qui présentent quelque intérêt au point de vue médical, je n'ai pu constater d'influences arabes que dans le présent manuscrit.

Il me paraît inutile d'insister sur ce fait que toutes les figures que j'ai fait précédemment passer sous vos yeux, relèvent exclusivement et directement de la tradition grecque. Je me bornerai à vous faire remarquer qu'elles sont presque toutes d'inspiration païenne ; c'est ainsi que les traducteurs latins de la sphère de Petosiris ont conservé dans leurs exemples les noms d'Achille et d'Hector, au lieu de les remplacer par des noms tirés de l'Écriture sainte. Les seules traces du christianisme que l'on relève dans ces schémas sont la figure du Christ bénissant qui orne le Zodiaque du manuscrit latin 7028 de la Bibliothèque Nationale et quelques mots de la légende accompagnant l'une des figures du manuscrit latin 17868 : ' De ardore tremore, de tremore metu, de metu morte et carcere, de carcere redemptione, de redemptione resurrectionem vitæ.' Ces derniers mots n'ont pu être écrits que par un chrétien.

¹ Léopold Delisle, *Inventaire des manuscrits latins de Notre-Dame et d'autres fonds* . . . Paris, Aug. Durand et P. Lauriel, 1871, 8^o, p. 72.

[Monday Morning, August 11]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

THE BIBLIOGRAPHY OF BERNARD DE GORDON'S
'DE CONSERVATIONE VITÆ HUMANÆ'

BY MR. H. I. BELL

BEFORE dealing with the special subject of this paper it will, perhaps, be well to recall the few facts known or inferred concerning Bernard de Gordon. They are, indeed, so few that their recital will not take long. As to his birthplace and date of birth nothing seems to be certainly known. It has been inferred from his name that he was a Scotchman, but there is no other evidence to support this, and, as Littré points out, there are several places called Gourdon in France. He was almost certainly a native of France, probably of the south, and his active life was passed entirely at Montpellier. As an author he had the praiseworthy habit of dating his books, and it is in this way that we are able to fix his date with certainty. In the preface to his *Lilium Medicinæ* he tells us that it was begun at Montpellier 'after the twentieth year of my professorship', A. D. 1305.¹ It appears from this that he was a professor at Montpellier as early as 1285. The work I am about to consider was written in 1307; and this is the last date in the author's life which can be fixed with certainty. He is said² to have died about 1320, but I do not see on what evidence this assertion is made.

His chief work, by which he is mainly known, is his *Lilium Medicinæ*. His minor works have attracted less notice, and it is to four, or rather, if my thesis is justified, to one, of these that I wish to draw your attention. These four, which I regard as forming one work, and which I will refer to in future as parts 1, 2, 3, and 4, are the *De Phlebotomia*, the *De Urinis*, the *De Pulsibus*, and the *De Regimine Sanitatis*. Much confusion exists, not only in MSS. and editions, but also in modern authorities, concerning these treatises; and as I have recently had occasion to go into the question of their mutual relationship and to compare various MSS. and editions it

¹ 'Inchoatus autem est liber iste, cum auxilio magni Dei, in præclaro studio Montis Pessulani, post annum vigesimum lecturæ nostræ, anno Domini 1305, Mense Iulii,' Lyons 1574 edition, p. 6.

² *Nowelle Biographie Universelle*, s.v. Gordon (Bernard de), Chevalier; *Bio-Bibliographie*, s.v. Bernard, de Gordon.

occurred to me that it might serve a useful purpose to put on record the results I arrived at. Dr. Norman Moore, to whom I happened to mention the subject, suggested that the Medical Congress afforded a good opportunity for the publication of these results. It may well be that the facts I am about to state are already well known to others, and they may actually have been published before ; but I have not myself seen a quite satisfactory account of the work in question, and, moreover, the evidence I have collected as to the MSS. and editions in the British Museum will perhaps be of value even apart from the conclusions based upon it. I have not been able to see either MSS. or editions other than those in the Museum, and, having had to write this paper at very short notice, I have been unable to make such extensive researches as might have given greater completeness to my treatment of the subject.

The confusion alluded to is seen very markedly not only in the old Sloane catalogue but even in the Sloane index of 1904, under the heading 'Gordonio (Bernardus de)'. Leaving out of account the first entry 'Tractatus medici', under which are placed MSS. containing more than one work of the author, we find under the title 'De conservatione vitæ humanæ' three MSS., of which one, Sloane 2481, contains the whole work ; one, Sloane 3096, contains part 1, under the title 'De Conservatione Vitæ Humanæ', with the latter portion of part 4 as a quite independent treatise ; and the other, Sloane 3097, contains part 4 only, under the same title. The next entry, 'Opus medicum in 4 particulis,' is a MS. of the whole work ; but as no title is inserted in the MS. its identity with the *De Conservatione* was not recognized. Lower down, under 'Liber urinarum' we get references to part 2 only. The next entry, 'De regimine sanitatis,' is part 4, and the next, 'De phlebotomia,' part 1 only ; and, finally, an entry lower down, 'De pulsibus,' refers to part 3 only.

Fabricius¹ regards the various parts of the work not only as standing in no peculiar relationship to one another, but as merely portions of the *Lilium Medicinæ* ; and all the bibliographers whose works I have seen either do not mention the work I am now dealing with or treat its various parts as independent treatises. The reason for this confusion is partly that the parts, or, as the MSS. call them, particulæ, were from the first not infrequently copied singly, and partly that the title sometimes given to the complete work was more often that of part 4 only. It is clear from Bernard's own words in the preface that the main portion of the work was the first particula, *De Phlebotomia*, and the title of this might therefore be applied to the whole ; but since it is the natural title of part 1 only, and the work as a whole embraces much besides phlebotomy, it seems most convenient to call it *De Conservatione Vitæ Humanæ*, a title it bears

¹ *Bibliotheca Latina*, 1754, tom. i, p. 231 : 'Quæ eiusdem Bernhardi feruntur, de urinis, de febris, de sterilitate, regimen, et de Conservatione Vitæ humanæ, ex eodem Lilio repetita sunt.' Here 'regimen' and 'de Conservatione Vitæ humanæ' are probably merely different names for part 4 ; unless the latter refers to part 1.

in one of the MSS.¹ I have seen, and to give to part 4 the title *De Regimine Sanitatis* which is applied to it in several MSS., and which Bernard's preface to the whole work shows to have been his own.

The most satisfactory account of the work I have seen is that by Émile Littré in vol. xxv of the *Histoire littéraire de la France*, pp. 328–37. He quotes Bernard's own remarks on the work in his preface (I will follow his example directly) and concludes from them, 'On voit que les traités des Urines, du Pouls, et de la Conservation de la vie humaine, qui vont suivre, sont des appendices de celui de la Phlébotomie.' His further remark, 'Ce livre de la Phlébotomie n'a pas été imprimé,' is an error, as will appear presently. His previous statement, that the three last particulæ of the work are appendices to that on phlebotomy, is correct and, so far as it goes, satisfactory, and he proceeds to give a useful conspectus of the contents of the work, though there are one or two small inaccuracies, as when he states, on p. 333, that part 4 has never been printed. His account is marred, however, by his failure to emphasize the fact that the last three particulæ are not treatises composed by way of supplement to the first, but that they and it are integral and original parts of a single work; indeed, he was clearly ignorant of this fact, for, on p. 322, in his account of Bernard's career, he says, 'En 1307 nous le retrouvons encore travaillant. On a de lui un livre sur la Phlébotomie; et comme cet opuscule est cité dans le traité des Urines,² il faut penser qu'il a prolongé au-delà de cette année sa carrière d'écrivain.' And lower down he says, 'C'est après le *Lilium* qu'il a composé son traité de la Conservation de la vie humaine, de *Conservatione vitæ humanæ*; car on lit dans le *Lilium*, "Bien que par la grâce de Dieu nous ayons l'intention de donner un traité sur le régime de la santé."'³

It may indeed be maintained that Littré is right; that parts 2–4 were in fact separate treatises supplementary to, but not forming a single work with, part 1 on phlebotomy. This view receives some apparent support from the fact that none of the fourteenth-century MSS. I have seen gives the four particulæ as sections of a single treatise; all alike either contain one or more particulæ, but not all four, or else fail to make clear their unity. The only sources in which the whole four are given together unmistakably as one work are two MSS. of 1428 and 1470 respectively. In spite of this fact the connexion of the four tracts is, I think, certain, for the following reasons.

¹ One might really say two, for in Sloane MS. 3096, where parts 4 and 1 are given (separated by other works) as independent treatises, they are both described, part 4 in the colophon and part 1 in the title, as *liber de conservatione vite humane*. The fact that part 1 bears this title instead of the usual *De Phlebotomia* is almost certainly due to the fact that the scribe, though he treated it as a separate work, was copying from a MS. which contained the whole under the above title.

² *De Urinis*, cap. 1, 'sicut diximus in tractatu de phlebotomia.'

³ *Lilium*, part v, cap. 8, *De regimine sanitatis*, 'Et licet per Dei gratiam de regimine sanitatis longiorem tractatum intendamus edere.'

In the first place, the words of Bernard himself in his preface, quoted by Littré, naturally imply that he conceived of the whole as a single work. I translate them from the Lyons edition of 1574, p. 668. After explaining why he conceived the idea of a tract on phlebotomy, he proceeds :

‘ Now, however, when I consider with myself, I deem myself unworthy of this compilation ; but I have ventured to undertake this work, confident of the gracious light of our Saviour ; and when I recall that not long since I wrote in all humbleness (?) the Lily of Medicine, which was received without envy and with good will, I can more freely attempt this work ; otherwise this treatise might perchance say to me,

Sub lare privato tutius esse puto.

‘ Therefore in the name of our Lord Jesus Christ I begin this treatise in this manner :—The first book will be of phlebotomy, because among all the instruments with which a physician operates no such miraculous operation is found as with phlebotomy, when practised in the right manner and on the right occasion. And since this cannot be known unless cognizance be taken of the signs, and the signs cannot be had so well as by the urine, I will add in the second book an account of urines. And because the quantity of blood [to be drawn] in phlebotomy cannot be determined unless the virtue be known, and the virtue cannot be known without a knowledge of the pulse, I will compile an account of the pulses in the third book. And because phlebotomy is of universal use in the regimen of the human body, and the regimen cannot be known without the regimen of health, I will set in order the regimen of health in the fourth book. Run therefore virgins, run old men to this great spectacle ; since every age and every sex and every capacity, according to the nature and configuration of its body, will here find its pleasant and due mansion. The book was begun in the illustrious school of Montpellier, the year of the incarnation of our Lord, 1307, the 22nd day of February, when the moon was in conjunction with the sun, towards the seventh degree of Pisces.’¹

¹ ‘ Nunc autem, cum recurro ad conscientiam, hac copulatione [*sc.* compilatione] reputo me indignum : sed ausus sum hoc opus aggredi, confidens de gratioso lumine Salvatoris : et cum hoc reduco ad memoriam, quod non est multum temporis, quo scripsi humilibus [hardly “ for the humble ” ; is it a corruption of *humiliter* ? or has a word been omitted, such as *viribus* ? All the MSS. read thus] Liliū medicinæ, quod sine liuore et cum benignitate est receptum : atque ideo hoc opus aggredi liberius attentabo : quoniam aliter fortassis iste tractatus posset mihi dicere,

Sub lare priuato tutius esse puto.

‘ In nomine igitur domini nostri Iesu Christi hunc tractatum incipio per hunc modum, Primus liber erit de phlebotomia, quia inter omnia instrumenta, cum quibus operatur medicus, non videtur ita miraculose operari, sicut cum phlebotomia, quando fit sicut oportet, et vbi oportet. Et cum hoc sciri non possit, nisi cognitio habeatur per signum, et signa non habeantur ita bene, sicut per vrinam : ideo de vrinis in 2. libro aggregabo. Et quia quantitas sanguinis in phlebotomia recipi non poterit, nisi virtus cognoscatur, et virtus cognosci non possit sine scientia pulsuali : ideo in tertio libro aliquid de pulsibus compilabo. Et quia phlebotomia valet vniuersaliter in regimine corporis humani, et regimen non possit sciri sine regimine sanitatis : ideo in quarto libro regimen sanitatis ordinabo. Currite igitur virgines, currite senes ad hoc grande spectaculum : quoniam et omnis ætas, et omnis sexus, et omnis solertia iuxta naturam et configurationem sui corporis hic inueniet iocundam

In the second place, the two fifteenth-century MSS. already referred to as containing all the four parts as a single work, describe them as respectively the 1st, 2nd, 3rd, and 4th particula or pars of the work ; and in the fourteenth-century Add. MS. 26841, where the scribe is evidently ignorant of the essential unity of the work, he nevertheless describes parts 3 and 4 as respectively the 3rd and 4th particula, a description which is meaningless as he has copied the treatise, and which clearly points back to an archetype where it was correctly given as a single work.

The most conclusive proof is, however, a colophon found in several MSS., both those which contain the whole work and those which do not, at the end of part 4. This colophon does not occur in the printed texts of this part and was clearly unknown to Littré. That it is genuine is certain from the fact that it occurs in a MS. (Sloane 3097) dated in 1311—that is to say, only four years after the composition of the work and probably during Bernard's lifetime. It reads as follows : ' Blessed be God who began and brought to completion. Now this book was begun on the twenty-second day of February as was said at the beginning. It was completed with the help of the great God on the ninth day of November in the circuit of the same year, the moon being in Virgo in the twenty-fifth degree.'

Now in this part itself no date is mentioned at the beginning. It is, however, stated, as you will remember, in the extract I quoted from the preface to part 1, where the date of commencement is given as Feb. 22, 1307. The colophon is therefore meaningless apart from that passage ; and it is an evidence of the want of intelligence in scribes that several MSS. where part 4 is given as a separate treatise nevertheless contain the colophon. In two MSS., however, and in the printed texts it is omitted. The omission is doubtless due to the fact that when part 4 was treated as a separate treatise the colophon was, as I have said, meaningless ; but it is to be noted that one of the MSS. which omits it does give the four parts as a single work.

I will conclude with a few general remarks on the MSS. and editions. The earliest MS. in the Museum is that already referred to as dated in 1311, a probably French MS. which contains only part 4. Closely connected with it is another French fourteenth-century MS., Add. 38689, which also contains only part 4, and which, unlike Sloane 3097, omits the colophon, evidently because it had no relevance alone. An English tradition is seen in two fourteenth-century MSS. containing parts 1, 2, and 4 as separate treatises and a fifteenth-century MS. containing only part 2. These have a feature in common and differ from all other MSS. in that they omit the latter part of the last chapter of parts 1 and 2, and in part 2 meaninglessly change an 'in' into 'et'. The two MSS. which alone give the whole treatise correctly are dated respectively in 1428 and in 1470. The first,

et debitam sibi mansionem. Inchoatus est autem iste liber in præclaro studio Montis Pessuli, anno incarnationis domini 1307. die 22. Februarij, Luna celebrante synodum cum sole, versus septimum gradum piscium.'

written at Valladolid, gives it no general title. The second is probably German, and calls it the 'liber de conservacione vite humane'.

As regards editions,¹ the earliest I know of is an edition at Ferrara in 1487 of part 2, the *De Urinis*, followed by a different tract, the *De Cautelis Urinarum*, and then by part 3, the *De Pulsibus*. In the Venice edition, 1498, of the *Lilium Medicinæ*, that work is followed by other treatises of Bernard, and among them are included the three contained in the Ferrara volume. They were after this a regular part of editions of the *Lilium*, but are not included in the French and Spanish translations. Part 4 was first published as a separate volume at Leipzig in 1570. In this edition, however, the 'quæstiones' which occur at the end of many of the chapters are collected together at the end, as a kind of appendix. Finally, in the Lyons edition of the *Lilium*, in 1574, the whole work was for the first time printed together; but even here the connexion of the parts with one another is not marked, the significant colophon at the end is omitted, and the *De Cautelis Urinarum* is interpolated after part 2. In the Frankfort edition of 1617 parts 1 and 4 are once more omitted.

MSS. AND EDITIONS OF THE WORK.²

A. Manuscripts.

I. MSS. containing all four parts :

(1) Add. MS. 26841, ff. 1-71b, vellum, fourteenth century. A good deal damaged, particularly at the beginning and end, by fire. Two columns to the page. Initials in red and blue. Contains also other medical treatises, by Bernard and other authors. Nothing is apparently known as to its history. The four parts are not treated as a single work.

f. 1, col. 1, preface, imperfect at the beginning (probably about nine lines are lost); ends f. 1b, col. 1, '[uer]sus septimum gradum piscium'; *ib.* a table of chapters; f. 1b, col. 2, beg. 'Flebotomia est euacuacio vniuersalis'; ends f. 16b, col. 1, 'nisi corpore mundificato. Hic terminatur de Flebotomia'; *ib.* follows a separate treatise, the *De Crisi*, beg. 'Crisis est uelox et uehementis (*sic*) motus'; ends f. 22, col. 1, 'et senibus ubilibet curatur'; *ib.* 'Incipit tractatus de vrinis magistri Bernhardi de Gordonio,' preface beg. 'Dilexi ueritatis scientiam'; ends f. 22b, col. 1, 'prosperet iter nostrum'; *ib.* a list of chapters; f. 22b, col. 2, treatise beg. 'URina est colamentum sanguinis'; ends f. 44b, col. 1, 'frigus in extremitatibus'; *ib.* 'Incipit vnicum capitolum tertie particule et singulare de pulsibus,' beg. 'Pulsus est nunctius'; ends f. 45b, col. 1, 'secundum Galienum³ et secun-

¹ For the bibliography of Bernard's *Lilium* see H. Carlowitz, *Der Lepraabschnitt aus Bernhard von Gordons 'Lilium Medicinæ'*, etc., Leipzig, 1913 (p. 11), for a copy of which I am indebted to the kindness of Prof. Sudhoff. Several of the editions not in the British Museum may contain parts of our treatise.

² In the following quotations from the MSS. I have conformed to modern usage as regards the use of capitals and punctuation, but have reproduced the spelling of the original, including the use of *u* and *v*. In the quotations from printed works I have followed the text as regards the use of capitals and punctuation also, and have marked the division of lines. In both I have tacitly extended abbreviations.

³ The word is usually abbreviated, but in two MSS. it is given in full as 'Galienum', which was a common spelling in the Middle Ages. In the editions I have extended as 'Galenum'.

dum Auicennam'; *ib.* 'Incipit 4^a particula de conseruatione uite humane seu regimen sanitatis magistri Bernhardi de Gordonio,' preface beg. col. 2, 'Secundum intentionem (?) Aristotelis'; ends f. 46b, col. 2, 'ante tribunal iudicis ueniamus'; *ib.* list of chapters; f. 47, col. 1, treatise beg. 'Mulier cum approximatur ad partum'; ends f. 71b, col. 1, 'Paremus igitur nos ad bene viuendum, et ita mors erit bona, quia mors impiorum pessima. Bene autem mori uia est in uitam eternam, ad quam nos perducatur Christus dei (*sic*) filius dei uiui. Amen. Benedictus deus qui inceptit et compleuit. Inchoatus autem fuit iste liber 22 die Februarij sicut in principio dictum fuit, terminatus autem cum auxilio magni dei [nono omitted] die Nouembris eiusdem anni curriculo, luna existente in virgine, 25 graduum. Explicit liber de conseruacione uite humane, editus per magistrum Bernardum de Gordonio in preclaro studio montis Pessulani.

'Hoc opus exegi quod nec Iouis ira nec ignis
Nec ferrum nec edax poterit abolere uetustas.'

[For these lines see below, under II. 3.]

(2) Sloane MS. 217, ff. 8-105. Paper. Written at Valladolid, 1428. Two columns to the page. Spaces left for illuminated or decorated initials, which have never been added. Contains also the *De gradibus* of Bernard, some medical quæstiones, and an epistle of St. Bernard. The four parts are given as a single work.

f. 8, col. 1. No title. Preface beg. '[H]omo est princeps et rex'; ends f. 8b, col. 1, 'uersus septimum gradum piscium'; *ib.* list of chapters; f. 9, col. 1, treatise beg. '[F]lebotomia est euacuacio vniuersalis'; ends f. 27b, col. 2, 'nisi corpore mundificato. Explecta (*sic*) est prima particula huius tractatus. Benedictus qui inceptit et compleuit'; *ib.* 'Incipit 2^a particula huius libri et est tractatus 2^{us} de vrinis,' preface beg. '[D]ilexi veritatis scientiam'; ends f. 28, col. 2, 'prosperum faciat iter nostrum'; f. 28b, col. 1, list of chapters; *ib.* col. 2, treatise beg. '[U]rina est colamentum sanguinis'; ends f. 60, col. 1, 'frigus in extremitatibus. Explicit 2^a particula'; *ib.* 'Incipit particula 3^a de pulsibus et est capitulum vnum singulare'; *ib.* col. 2, treatise beg. '[P]ulsus est nuncius'; ends f. 62, col. 1, 'secundum Galienum (in full) et Auicennam. Explicit liber tercius'; *ib.* 'Incipit quarta particula de conseruacione vite humane magistri Bernardi de Gordonio,' preface beg. '[S]ecundum intencionem Aristotelis'; ends f. 64, col. 1, 'ante tribunal iudicis veniamus'; *ib.* list of chapters; *ib.* col. 2, treatise beg. '[M]ulier cum aproximatur (*sic*) ad partum'; ends f. 105, col. 1, 'Paremus igitur ad bene viuendum, et ita mors erit bona, quia mors impiorum pessima. Bene autem mori via est in vita (*sic*) eterna (*sic*), ad quam nos perducatur Christus filius dei viui. Amen. Explicit liber de conseruacione vite humane factus et editus a magistro Bernardo de Gordonio, cuius anima requiescat in pace.'

(3) Sloane MS. 2481, ff. 2-86b. Paper. Written in 1470. Probably German. Two columns to the page. Initials in red. Contains also other works by Bernard and others. The four parts are given as a single work.

f. 2, col. 1, general title, 'Incipit liber de conseruacione vite humane magistri Bernardi de Gordonio,' preface beg. 'HOMO enim est princeps et rex'; ends f. 2b, col. 1, 'uersus vij gradum piscium'; *ib.* list of chapters; *ib.* treatise beg. 'Fleubothomia est euacuacio vniversalis'; ends f. 16, col. 2, 'nisi corpore mundificato. Expleta est pars prima regiminis sanitatis scilicet de flebotomia. Benedictus deus in secula. Amen'; f. 16b, col. 1, 'Incipit particula secunda de vrina,' preface beg. 'Dilexi

ueritatis scientiam' ; ends f. 17, col. 1, 'prosperet iter nostrum' ; *ib.* list of chapters ; *ib.* col. 2, treatise beg. 'URina est colamentum sanguinis' ; ends f. 43, col. 2, 'frigus in extremitatibus. Et in hoc finitur huius operis pars 2^a, que est de vrinis. Deo gracias' ; f. 43b, col. 1, 'Incipit particula tertia de pulsibus,' beg. 'PVlsus est nuncius' ; ends f. 45, col. 2, 'secundum Galienum (in full) et Auicennam. Et in hoc finitur huius operis pars 3^a, que est de pulsibus. Benedictus deus in secula' ; f. 45b, col. 1, 'Incipit particula quarta, que est regimen sanitatis,' preface beg. 'SEcundum intencionem Aristotelis,' in much shortened form ; ends *ib.* col. 2, 'ante tribunal iudicis ueniamus' ; *ib.* list of chapters ; f. 46, col. 1, 'MVlier quum approximat (*sic*) ad partum' ; ends f. 86b, col. 1, 'Paremus ergo nos ad bene viuendum, et ita mors erit bona, quia impiorum mors pessima. Bene autem mori est via in vitam eternam, ad quam nos perducatur Christus filius dei uiui. Amen. Benedictus deus qui incepit et compleuit. Inchoatus autem fuit liber iste 22 die Februarij sicut in principio dictum est. Terminatus autem est cum auxilio magni dei nono die Novembris eiusdem anni curriculo, luna existente in virgine. Deo gracias. Explicit liber de conseruacione vite humane editus a magistro Bernardo de Gordonio in preclaro studio montis Pessulani,' date of MS.

II. MSS. containing some but not all of the parts.

(1) Sloane MS. 512, ff. 270-374b. Vellum fourteenth century, English. Two columns to the page. Initials decorated in red and blue ; also illuminated initials containing miniatures, with borders. Contains also the *Lilium*. On f. 270 are two coats of arms, one of which may be Grandison, co. Lancaster ; the other is not yet identified. Belonged to Francis Bernard, M.D. Parts 1, 4, and 2, in this order, are given as separate treatises. At the end a seventeenth-century hand has added part of part 3.

f. 270, col. 1, initial with miniature and border, 'Incipit liber de Flebotomia, editus in preclaro studio montis Pessulani per magistrum Bernardum de Gordonio,' preface beg. 'HOMo est princeps et rex' ; ends f. 270b, col. 1, 'uersus 7 gradum piscium' ; f. 271, col. 1, list of chapters ; *ib.* col. 2, treatise beg. 'Fleubothomia est euacuacio uniuersalis' ; ends f. 293, col. 2, about half-way through the last chapter, with the words 'Loca autem in quibus debet fieri cauterium [so, with verbal differences, the other copies ; then] patent alibi, ideo hic cesso. Explicit liber de flebotomia' ; f. 293b, col. 1, initial with miniature, 'Incipit liber de regimine sanitatis, editus in monte Pessulano per magistrum Bernardum de Gordonio,' preface beg. 'SEcundum Aristotelem' ; ends f. 295b, col. 2, 'ante tribunal iudicis ueniamus' ; *ib.* list of chapters ; f. 296, col. 1, treatise beg. 'MVlier cum aporpinquatur (*sic*) ad partum' ; ends f. 345, col. 2, 'Paremus nos igitur ad bene viuendum, et ita mors erit bona, quia mors impiorum pessima. Bene autem mori uia est ad uitam eternam, ad quam nos perducatur Christus filius dei uiui. Amen. Benedictus deus qui incepit et compleuit. Inchoatus autem fuit iste liber xxij Februarii sicut in principio dictum est. Terminatus est autem cum auxilio magni dei ix. die Nouembris eiusdem anni curriculo, luna existente in virgine xxv. gradu. Explicit regimen sanitatis Bernardi de Gordonio' ; f. 345b, col. 1, initial with miniature and border, 'Incipit liber urinarum magistri Bernardi de Gordonio,' preface beg. 'Dilexi scienciam veritatis' ; ends f. 346, col. 2, 'iter nostrum prosperet' ; *ib.* list of chapters ; f. 346b, col. 2, treatise beg. 'URina est colamentum sanguinis' ; ends f. 372b, about a third of the way through the last chapter, 'resoluens materiam et [sc. in]

uaporem. Explicit. Expliciunt vrine Bernardi de Gordonio'; f. 373, added in hand of seventeenth century the latter part of the *De Pulsibus*, beg. 'Pulsus enim non est aliud quam motus' (in the Lyons edition, 1574, p. 825, the 61st line from the beginning), ends 'secundum Galienum Auicennam et alios, etc.' [N.B. Possibly the whole particula was copied and a leaf has been lost.]

(2) Sloane MS. 334, ff. 218-290. Vellum, fourteenth century, English. Two columns to the page. Initials decorated in red and blue; also illuminated initials. Contains also the *Lilium* and other works of Bernard. Belonged to Thomas Duffield, doubtfully identified in the Sloane Index with the Chancellor of Lincoln, who died in 1423, but the hand (Tudor) in which the name is written makes this impossible. Afterwards belonged to Francis Bernard, M.D. Parts 4, 1, and 2 are given, in this order, as separate treatises.

f. 218, col. 1, illuminated initial, 'Incipit liber de conseruacione uite humane siue de regimeine sanitatis Bernardi de Gordonio,' preface beg. 'SECundum Aristotelem'; ends f. 219b, col. 1, 'ante tribunal iudicis veniamus'; *ib.* list of chapters; *ib.* treatise beg. 'MVlier cum appropinquat (*sic*) ad partum'; ends f. 251, col. 2, 'Paremus nos igitur ad bene uiuendum, et ita mors erit bona, quia mors impiorum pessima. Bene autem mori uia est ad uitam eternam, ad quam nos perducatur Christus filius dei uiui. Amen. Benedictus deus qui incepit et compleuit. Inchoatus est (*sic*) autem fuit iste liber 22^o die Februarij sicut in principio dictum est. Terminatus autem est cum auxilio dei 9 die Nouembris eiusdem anni curriculo, supra (*sic*) existente in uirgine 25 gradu. Explicit'; f. 252, col. 1, decorated initial in red and blue, 'Incipit tractatus de flebotomia, editus a magistro Bernardo de Gordonio,' preface beg. 'HOMO est princeps et rex'; ends f. 252b, col. 1, 'versus 7 gradum piscium'; *ib.* list of chapters; *ib.* col. 2, treatise beg. 'FLebotomia est euacuacio uniuersalis'; ends f. 268b, col. 2, 'loca autem in quibus debet fieri cauterium patent alibi, ideo hic cesso. Explicit tractatus de flebotomia magistri Bernardi de Gordonio'; *ib.* 'Incipit tractatus de vrinis,' preface beg. 'Dilexi scientiam veritatis'; ends f. 269b, col. 1, 'iter nostrum prosperet'; *ib.* list of chapters; *ib.* col. 2, treatise beg. 'URina est colamentum sanguinis'; ends f. 290, col. 2, 'resoluens materiam et uaporem. Expliciunt vrine.'

(3) Sloane MS. 3096. Vellum. A composite volume. The first part to f. 220 is a MS. of the thirteenth century. Then begins a different MS. of the fourteenth century. Italian. Two columns to the page. Initials in red and green. This MS. extends to f. 323, and contains the *Lilium*. On f. 324 begins (imperfectly) a separate MS. Also probably Italian. Probably in three different hands. Two columns to the page. Initials in red and blue. The MS. begins imperfectly in chapter ii of part 4; after this MS. was united with the previous one, a hand distinct from those seen in either added, on a blank leaf and the end of the preceding leaf of the MS. containing the *Lilium*, the earlier part of chapter ii of part 4.

f. 322b, col. 2, 'De regimeine in cibo' (chap. ii of part 4), beg. '[N]Vllus debet sumere cibum.' On f. 324, col. 1, 'De exhibitione cibi per comparisonem ad membra' (a section of the same chapter), beg. 'Aliqui enim sunt qui habent'; treatise ends f. 330, col. 1, 'Paremus nos igitur ad bene uiuendum, et ita mors erit bona, quia mors impiorum pessima. Bene autem mori uia est in uitam eternam, ad quam uos (*sic*, apparently) perducatur Christus filij (*sic*) dei uiui. Amen. Benedictus deus qui incepit et compleuit. Incohatus autem fuit iste liber xxij. die Febroarij sicut in principio dictum est. Terminatus est autem cum auxilio magn[i] dei ix. die Nouembris eiusdem anni curriculo, una (*sic*) existente in uirgine xxv.

gradu. Explicit liber de conseruatione uite humane, editus per magistrum Bernardum de Gordonio in preclaro studio montis Pesullani.

'Hoc opus exegi quod nec Iouis nec ira nec ignes
Nec ferrum nec edax poterit abolere uetustas.'

[In Add. 26841 above these lines also follow the *De Crisi*, but in a metrically correct form :

'Hoc opus exegi quod nec Iouis ita (*sic*) nec ignes
Nec ferrum poterit nec edax abolire (*sic*) uetustas.']

Then follow other works of Bernard. f. 339, col. 1, 'Incipit liber de conseruatione vite humane, editus a magistro Bernado (*sic*) de Gordonio in preclaro studio montis Pessulani,' preface beg. 'HOMO enim princeps est et rex'; ends *ib.* col. 2, 'uersus vij. gradum piscium'; *ib.* list of chapters; *ib.* treatise beg. 'Flebotomia est euacuatio uniuersalit' (*sic*; ūl'it); ends f. 344b, col. 2, 'nisi in corpore mundificato.'

III. MSS. containing one part only.

(1) Sloane MS. 59, ff. 156-81. Paper, fifteenth century, English. One column to the page. Contains miscellaneous medical works, including some by Arnaldus de Villa Nova. Was given by John Somerset, M.D. (physician to Henry VI), to Peterhouse, Cambridge, the use of it being reserved to Roger Marchall for life. The *De Urinis*.

f. 156, 'Bernardus de Gordonio de vrinis sed deest prologus,' beg. 'Urina est colamentum sanguinis'; ends f. 181, 'resoluens materiam et vaporem. Expliciunt vrine Bernardi de Gordonio, scripte Oxonie in profesto Sancti Dionisi.'

(2) Sloane MS. 3097, ff. 1-61. Vellum, 1311, French. Two columns to the page. A good hand with fine illuminated initials and borders. The *Regimen Sanitatis*, followed by the *Tacuinum Sanitatis* of Ibn Butlān.

f. 1, col. 1, 'Incipit liber de conseruacione uite humane magistri Bernardi de Gordonio,' preface beg. 'SECUNDUM intencionem Aristotilis'; ends f. 3, col. 2, 'ante tribunal iudicis veniamus'; *ib.* list of chapters; f. 3b, col. 2, treatise beg. 'MVlier cum approximatur ad partum'; ends f. 61, col. 2, 'Paremus igitur nos ad bene uiuendum, et ista (*sic*) mors erit bona, quia mors impiorum pessima. Bene autem mori uia est in uitam eternam, ad quam nos perducit Christus filius dei uiui. Amen dicant omnia. Benedictus deus qui incepit et compleuit. Inchoatus autem fuit iste liber uicesima secunda die Februarij sicut in principio est dictum. Terminatus est autem cum auxilio magni dei nona die Nouembris eiusdem anni circulo, luna existente in uirgine, uicesimo quinto gradu. Explicit liber de conseruacione uite humane die innocencium [Dec. 28] 1311.'

(3) Add. MS. 38689, ff. 1-56. Vellum, fourteenth century, French. Two columns to the page. Initials decorated in blue and red; some illuminated initials. The *Regimen Sanitatis*, followed by Ibn Butlān's *Tacuinum Sanitatis*, and that by the *Epistola de morte amici consolatoria* of Vincent of Beauvais. A well-written MS., but inferior both in script and illumination to Sloane 3097, and the scribe is careless. Belonged to the Celestines of Amiens, to whom it was given [in the fourteenth to fifteenth century] by Hugues and Jehan d'Ailly. Chardin MS. 882. Phillipps MS. 818.

f. 1, col. 1, 'Incipit liber uite humane magistri Bernardi de Gordonio, preface beg. 'SECUNDUM intencionem Aristotilis'; ends f. 3b, col. 1, 'ante tribunal iudicis ueniamus'; *ib.* list of chapters; *ib.* col. 2, treatise beg. 'MVlier cum approximatur ad partum'; ends f. 56, col. 1, 'Paremus igitur nos ad bene uiuendum, et ista mors erit bona, quia mors impiorum

peissima. Bene autem mori uia est in uitam eternam, ad quam nos perducat Christus filius dei uiui. Amen dicant omnia.'

[N.B. This MS. is very closely related to the preceding. This is shown by many facts, of which the following may be mentioned. In both the *Regimen Sanitatis* is followed by Ibn Butlān's *Tacuinum Sanitatis*, where also the texts of both strongly resemble one another. The differences of reading I have noticed¹ are small and unimportant, and in many cases are certainly to be attributed simply to careless copying. In the concluding words of the treatise both MSS. have the meaningless 'ista', whereas all other MSS. I have seen read, correctly, 'ita.' Both have the spelling 'Aristotilis'. Both, against the other texts, have 'Amen dicant omnia'. Lastly, in chapter 17 (Sloane 3097, f. 36, col. 2; Add. 38689, f. 35, col. 1) both read 'aut quod non ueniat multa', leaving a space for a word not read, whereas all other MSS. and the editions have the missing word, 'pluuia'. Add. 38689 omits the colophon, presumably because it was not understood without part 1; it also gives the title as 'liber uite humane'. This is unique, and probably the scribe, who is very careless, has accidentally omitted 'de conseruatione'. I am inclined to think that this MS. is not derived directly from Sloane 3097, but is taken either from an intermediate copy or from the archetype of it. The omission of words or a difference in their order is not, with this copyist, a certain argument; but I have noticed one or two places in the *Tacuinum Sanitatis* where Add. 38689 adds a word or words not found in Sloane 3097.]

B. Editions.

(1) No title-page. Printed 'Ferarie | per prouidum virum magistrum Andream gallum | Anno domini. 1487. die 4. Martij.' | Fol. Two columns to the page. Folios not numbered. Contains only the tracts noted below.

'Incipit Tractatus vrinarum Excellen[tissimi Medici Magistri Bernardi de | Gordonio.' | Preface beg. 'QUia bona corporis dispositio'; ends 'prosper (sic) iter nostrum.' [The concluding portion of the original preface is here given.] Same col. list of chapters; col. 2 of same page, treatise beg. 'VRina est colamentum sanguinis'; ends 'frigus in extremitatibus. | Explicit tractatus de vrinis editus a | magistro Bernardo de Gordonio.' | Here follows the 'tractatus de cautellis vrinarum', beg. 'CUM urina tibi'; ends 'in omnibus obediens. Et sic | est finis. Laus Deo.' Then, on a new page, the *De Pulsibus*, beg. 'PULsus est nun[tius]'; ends 'secundum Galenum et secundum | Auicenam. et alios etc.'

[(1b) Add here an edition not in the Museum: Hain 7803. Tractatus urinarum, and also Pantaleonis preclari medici pillularium, and Breuiarium practice exc. Reinaldi (Arnaldi) de Villanova. Hain gives no date or place of imprint.]

(2) 'Practica Gordonij dicta Lilium. | Tractatus eiusdem De vrinis.' Printed at Venice, 1498, 11 Kal. Jan. 'per Bonetum | Locatellum Bergomensem.' Fol. Two columns to the page. Contains the *Lilium*, followed by the *De Decem ingeniis curandorum morborum*, the *Regimen acularum*

¹ I ought to say that I have compared them only in certain passages, not throughout. This is sufficient to prove their close connexion, but the question whether Add. 38689 is copied from Sloane 3097 or whether, as I think more probable, it is derived either from an intermediate copy or from the same archetype cannot be conclusively settled without a more detailed collation than I have been able to make.

egritudinum, the *De pronosticis*, and then the *De Urinis*, etc. A new foliation begins after the conclusion of the *Lilium*.

f. 19b, col. 1, 'Incipit Tractatus vrinarum Excellentissimi Medici | Magistri Bernardi de Gordonio.' Preface beg. 'QUia bona corpo|ris di|positio'; ends *ib.* 'prosperet iter nostrum'; *ib.* list of chapters; *ib.* col. 2, treatise begins 'VRina est colamentum sanguinis'; ends f. 32, col. 1, 'frigus in extremitatibus. | Explicit tractatus de vrinis editus a magistro Bernar|do de Gordonio'; *ib.* *De Cautelis Urinarum* to f. 32b, col. 2; *ib.* 'Sequitur tractatus de pulsibus,' treatise beg. 'Pulsus est nuncius'; ends f. 33b, col. 1, 'secundum Galenum et secundum Auicennam et alios etc. | Finis. | Explicit tractatus de vrinis: et de cautelis vrinarum. cum | Tractatu de pulsibus,' etc.

(3) 'Practica Gordonij,' etc. Printed at Venice, 1521, 8 Apr., 'mandato et expensis nobilis viri domini Lu|ceantonij de Giunta Florentini.' Fol. Two columns to the page. Contains the *Lilium* and added tracts as in (2). A single foliation.

f. III, col. 1, 'Incipit Tractatus vrinarum Excellentissimi | medici Magistri Bernardi de Gordonio,' preface beg. 'QUia bona corpo|ris di|positio'; ends *ib.* 'prosperet iter nostrum'; *ib.* list of chapters; *ib.* col. 2, treatise beg. 'URina est colamentum sanguinis'; ends f. 122b, col. 2, 'frigus in extremitatibus. | Explicit tractatus de vrinis editus a magistro Bernar|do de Gordonio'; *ib.* *De cautelis urinarum* to f. 123b, col. 1; *ib.* 'Sequitur tractatus de pulsibus,' treatise beg. 'Pulsus est nuncius'; ends f. 124, col. 2, 'secundum Galenum et secundum Auicennam et alios etc. Finis.'

(4) 'Bern. | Gordonij | Opvs Lilivm Mez|dicinæ inscriptum,' etc. 'Lvgdvni, | Apud Gulielmum Rouillium, | sub scuto Veneto. | 1551'. 8°. One column to the page. Contains the *Lilium* and added treatises as above.

p. 797, 'Bernardi | Gordonij de | vrinis tractatvs,' etc., preface beg. 'QVIA bona corporis dispositio'; ends *ib.* 'prosperet iter nostrum'; no list of chapters; *ib.* treatise beg. 'VRina est colamentum sanguinis'; ends p. 885, 'frigus in extre|mitatibus. | Explicit Tracta|tvs de vri|nis'; p. 886, the *De Urinarum Cautelis* to p. 891; p. 894 (*sic*; the next page after 891), 'De Cogni tione Pvlsvvm | tractatus vtilissi mus,' beg. 'PVLSVS est nuncius'; ends p. 896, 'secundum Galenum Auicennam et alios etc. | Finis totius praxis D. Bernardi Gordonij quæ Lilium | Medicinæ appellatur.'

(5) 'Bernhardi | de Gordonio Excellētiss. Medici | Tractatvs | de Conservatione Vitæ Hvmanæ,' etc. 'Nvnc primvm in Lvcm | editus opera | D. Ioachimi Bavdisii | Vratisl. Medici Physici Comi tatus Glacensis.' Printed at Leipzig (p. 223, '*Imprimebat Iohannes Rhambamense Februario, curante Ernesto Vogelin*' |, 1570, 8°. One column to the page. Contains only part 4. The quæstiones are collected together at the end.

At the beginning the editor's preface and a list of chapters; p. 1, 'De Conser|vatione Vitæ | Hvmanæ, sev | De Regimine | Sanitatis | Magi|stri Bernhardi | de Gordonio,' preface beg. 'SEcvndvm intentionem | Aristotelis'; ends p. 10, 'ante tribunal iudicis veniemus'; p. 11, treatise beg. 'MVlier cvm approximat | ad partum'; ends p. 148, 'erit opus perfecti magisterij'; p. 149, the quæstiones, ending p. 223, 'Paremus nos igitur | ad bene viuendum, et ita mors erit bona, quo niam mors impiorum pessima, bene autem mo ri via est in vitam æternam, ad quam nos per ducat Christvs filius Dei viui, sedens ad | dexteram patris quem inde venturum ad | iudicandum viuos et mortuos, ex pectamus, et qui est be nedictus Devs, | Amen.'

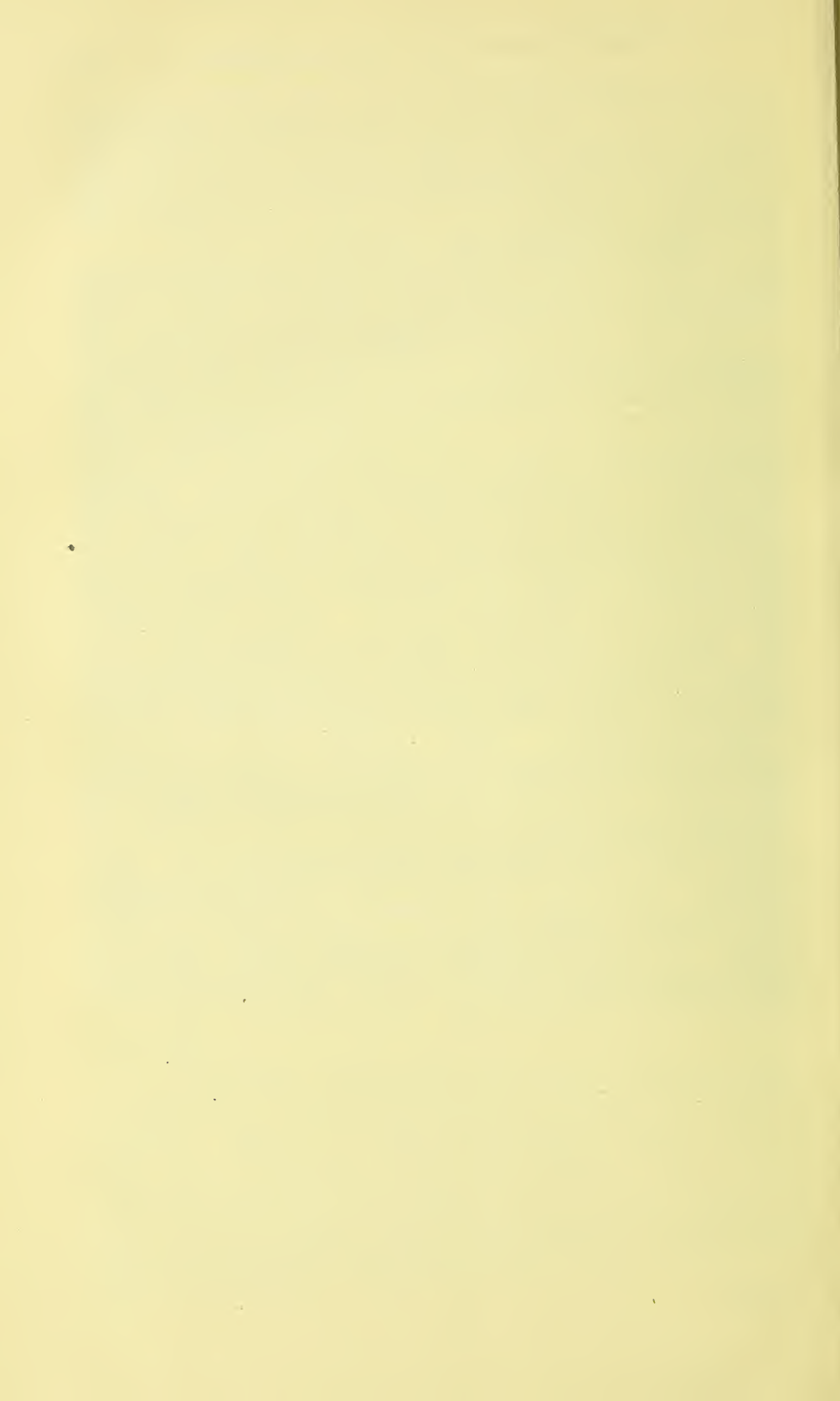
[The editor apparently got his text out of a MS. from Montpellier ; he says in his preface, 'quod cum ego mecum cogitarem, et haberem inter Bernhardi De Gordonio libros quos ex Academia Montis Pessuli manuscriptos in Germaniam mecum aduexi, vnum qui de Conseruatione uitæ humanæ inscribitur, quem ego nondum extare uidi, Et ut ex pluribus cum in Gallijs tum in Germania nostra, magni nominis medicis accepi, nostro sæculo plane est incognitus.']

(6) 'Bernardi | Gordonii | Opvs, Lilivm Me|dicinæ inscriptvm, de ' | etc. 'Lygdvni, | apvd Gvliel. Rovillivm. | M.D.LXXIII. | Cvm Privilegio Regis.' 8°. One column to the page. Contains the *Lilium*, followed immediately by the *De Conseruatione Vitæ Humanæ* (all 4 parts) ; the other treatises, preceded by the *De Floribus Diatarum*, come at the end.

p. 667, 'Bernardi Gor|donii de Phleboto|mia liber vnvs. | Præfatio,' preface beg. 'Homo est princeps, et rex' ; ends p. 668, 'versus septimum | gradum piscium' ; p. 669, treatise beg. 'Phlebotomia est euacuatio vniuersalis' ; ends p. 727, 'nisi corpore | prius mundifi|cato' ; p. 728, 'Bernardi Gordonii | Liber de Vrinis. | Procœmivm,' preface beg. 'Dilexi veritatis scientiam' ; ends p. 730, 'prosperet iter nostrum' ; *ib.* treatise beg. 'VRina est colamentum sanguinis' ; ends p. 818, 'frigus in | extremitatibus' ; *ib.* the *De Urinarum Cautelis* to p. 824 ; *ib.* 'De Cognitione | Pvlsvvm, Tracta|tus vtilissimus,' beg. 'PVLsus est nuntius' ; ends p. 829, 'secundum Galenum Auicennam et alios etc.' ; *ib.* 'Bernardi Gor|donii de Conserva|tione Vitæ Hvmanæ | Liber vnus. | Procœmivm,' preface beg. 'Secvndvm intentionem Aristotelis' ; ends p. 835, 'ante tribunal iudicis veniamus' ; *ib.* treatise beg. 'MVlier, cùm approximatur ad partum' ; ends p. 947, 'Paremus igitur nos ad bene viuendum, et ita mors erit bona : mors | autem impiorum est pessima : bene autem mori | vita (*sic*) est in vitam eternam, ad quam nos per|ducat Christus filius Dei viui. Amen. | Benedictus Deus, qui in|cepit et com|pleuit.'

(7) 'Lilivm Medicinæ | 'ΕΠΤΑ'ΦΥΛΛΟΝ : | Tractatvs | Nimirvm Septem Fo|liis sive Particvlis,' etc. 'Francofvrti | Apud Lvcam Iennis. | M.DC.XVII.' 8°. One column to the page. Contains the *Lilium* and added treatises as (2)-(4).

p. 1015, 'Tractatvs | Bernardi | Gordonii | De | Vrinis |', etc. 'Procœmivm,' preface beg. 'QVia bona corporis dispositio,' ends p. 1016, 'prosperet iter no|strum' ; *ib.* treatise beg. 'VRina est colamentum sanguinis' ; ends p. 1129, 'frigus in extre|mitatibus. | Finis' ; p. 1130, the *De Urinarum Cautelis* to p. 1138 ; p. 1139, 'Tractatvs | Bernardi | Gordonii | De | Cognitione | pulsvum vtilissimus,' beg. 'PVLsus est nuntius' ; ends p. 1145, 'secundum Galenum | Auicennam et alios | etc. | Finis omnium operum Gordonij.'



[Monday Morning, August 11]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

TYPHOID FEVER IN THE CIVIL WAR

By J. B. NIAS, M.D. OXON., M.R.C.P. LONDON

THE term Civil War is generally understood in this country to apply to the contest between King Charles I and his Parliament, which broke out in the year 1642 and lasted until 1646, when the King surrendered himself as a prisoner to the Scots. During these years almost the whole of England was subjected to the ravages of warfare on a large scale, and the result was that in the year 1670 the population of the country was not much larger than it had been in 1630, forty years earlier. Other factors have to be taken into account, such as the occurrence during this period of numerous epidemics of bubonic plague, but there can be little doubt that the chief obstacle to the growth of population was the material destruction which accompanies all warfare on a large scale. At the outbreak of these hostilities the population of England and Wales is believed to have amounted to about $5\frac{1}{2}$ millions of persons.

Military operations are always apt to be accompanied by outbreaks of epidemic disease, and this liability is greatly increased when the parties engaged have had no previous experience in the art of campaigning. Numerous blunders will then be committed both by commanders and by their medical advisers, and the Civil War furnishes a good many instances in point.

In the second year of this war, namely 1644, a Parliamentary army under the command of the Earl of Essex passed through the town of Tiverton in Devonshire, on its way to assist the adherents of the Parliament in Cornwall. It consisted of about 8,000 men, and it made a fortnight's stay at Tiverton, from the 5th to the 18th of July. Immediately after its departure, the town suffered from a most formidable outbreak of fever, which lasted for about four months, and added about 300 deaths to the normal annual mortality of the town. Tiverton then had a population of about 7,500 persons and the normal death-rate seems to have been about 20 per 1,000 per annum, it being a very prosperous and healthy little town, of which a good portion had been rebuilt only a few years previously owing to a disastrous fire (1613). But for the year

in question its death-rate amounted to about 60 in the thousand, or 1 in 17 of the inhabitants, as we learn from the historian of Tiverton, one Martin Dunsford, two-thirds of the mortality being thus due to the epidemic. Every one who could do so left the town, and the grass is said to have grown in the streets. It was not until the beginning of December that the epidemic ceased, and the inhabitants returned. The trouble never recurred, so far as we know, though Tiverton saw some fighting between the contending forces in the following year. The historians of the town describe the affection as a sweating sickness.

Now there are only two diseases to which this term is appropriate in the case of an epidemic of fever, one being the celebrated *Sudor Anglicus*, or sweating sickness of England of former years, which had long since been extinct, while the other is typhoid fever. One of the trivial names for the latter disease is remittent or recurrent fever, due to the paroxysm of heat and sweating which comes on each day as the temperature rises. The physicians of former times contrasted this daily rise with the intermittent paroxysms of ague or malarial fever, which are separated by longer intervals. Each day, in the early stages of enteric fever, the patient becomes restless and throws off the bedclothes, tossing about with sweating face and neck in a way that is very striking to the superficial observer; and it is this symptom, so exhausting to the patient, which is relieved by cold affusion or bathing, to a degree unequalled in any other continued fever. The sagacious Sydenham, treating such cases, used to allow his patients to dress so that they might lie on the outside of the bed, or on a couch. Whenever, then, we find among the old writers a continued fever described as a sweating sickness, at an epoch posterior to the disappearance of the true *Sudor Anglicus* from England, we should think in the first place of enteric fever.

The army, which thus passed through Tiverton, had marched by a circuitous route through Wiltshire and Dorsetshire from the neighbourhood of Oxford, a locality which had been invaded in the previous year by a most severe epidemic of the same type, which has been described for us by two contemporary authorities, the physicians Edward Greaves and Thomas Willis. The disease was brought to Oxford at the end of April 1643, by a force of 3,000 Royalist soldiers, who had evacuated the town of Reading, lower down on the Thames, with all the honours of war, including the removal of their sick and baggage, under the terms of a capitulation arranged with the Parliamentary army under the same Earl of Essex. As soon as these troops arrived at Oxford, where the sanitary arrangements for the accommodation of an army must have been of the worst description, the epidemic broke out again, beginning with the garrison and extending to the civil population. Both Willis and Greaves describe the disease with much distinctness, as a slow nervous fever showing a mortality of roughly 10 per cent., and therefore benign as compared with the plague, which fixed the standard of malignity for those times. It presented no striking symptoms at the outset beyond great debility (*magna virium imbecillitas*), and an eruption of spots in about

50 per cent. of the cases. It frequently attacked the whole of the inhabitants of a house, without seeming to be particularly dangerous to the visiting physician, in this respect contrasting strongly with the plague. The epidemic, as Willis tells us, persisted throughout the summer and spread to most of the villages round Oxford for a distance of nearly 10 miles, killing many of the old people, so that none remained, in some instances, to carry on the village traditions. As Oxford had been made by King Charles his head-quarters, and all his ministers and military staff were gathered there, the occurrence of this epidemic caused great alarm, and Greaves, who was quite a junior member of the medical profession in Oxford, was deputed by the King to investigate its cause, and draw up instructions for dealing with the symptoms for the benefit of all concerned. This Dr. Greaves did by means of a little pamphlet published anonymously, which is now very rare. I know of two copies only, both preserved in the library of the British Museum, on one of which the author's name has been written by some contemporary possessor. Without this note we should have been altogether at a loss for the identity of the writer. So satisfied was the King with this piece of work, and its result in getting the epidemic under control, that he conferred upon the author the unusual dignity of a baronetcy, at that time a very novel and exclusive rank which was not again bestowed upon a medical practitioner in this country until the year 1716, when it was conferred upon Sir Hans Sloane by King George I, in his capacity of physician-general to the army. There is no doubt that this contagious fever was a novelty to the medical profession in Oxford, because Greaves so describes it in the title of his pamphlet, 'Morbus Epidemius or the new disease of 1643.' But though the existing outbreak was got under, the disease was by no means abolished, and it continued to show itself in Oxford for years, cases of the same kind being recorded by Willis, who is posterior to Greaves in point of date, besides outbreaks mentioned by Antony à Wood, the contemporary historian of Oxford. It was from this infected locality that the army came, which brought calamity to Tiverton, twelve months later.

It will be as well next to consider the local conditions of Tiverton. Tiverton is a pretty little town which is situated on the river Exe, which runs from north to south through the county of Devon in a narrow valley bounded by high hills. At Tiverton the Exe is joined on its left or eastern bank by a river named the Loman or Loning, which flows down a flat valley. This river is liable to floods, being obstructed by the Exe, into which it enters at right angles. The town was consequently presented many centuries ago with a special water-supply by a local benefactor, which is drawn from a source on high ground to the north-east of the town. The water is, or was, brought to the town by an open conduit known as the town-leat, and was distributed throughout the streets by open channels, out of which the inhabitants drew their water-supplies by hand. On all sides, except the east and north-east, Tiverton is so closely shut in by hills of considerable height that it would be impossible for the commander of an army of 8,000 men, of whom a large

proportion were cavalry, to find any camping-ground for them, except in immediate contiguity to this town water-supply and the banks of the river Loman, as shown on the annexed plan (Fig. 1). The parts in this plan marked 'valley' are the only localities in the neighbourhood of the town where such a force could be encamped. After staying in Tiverton from the 5th to the 18th of July the army went on into Cornwall, where the expedition came to an unfortunate end, the Earl of Essex

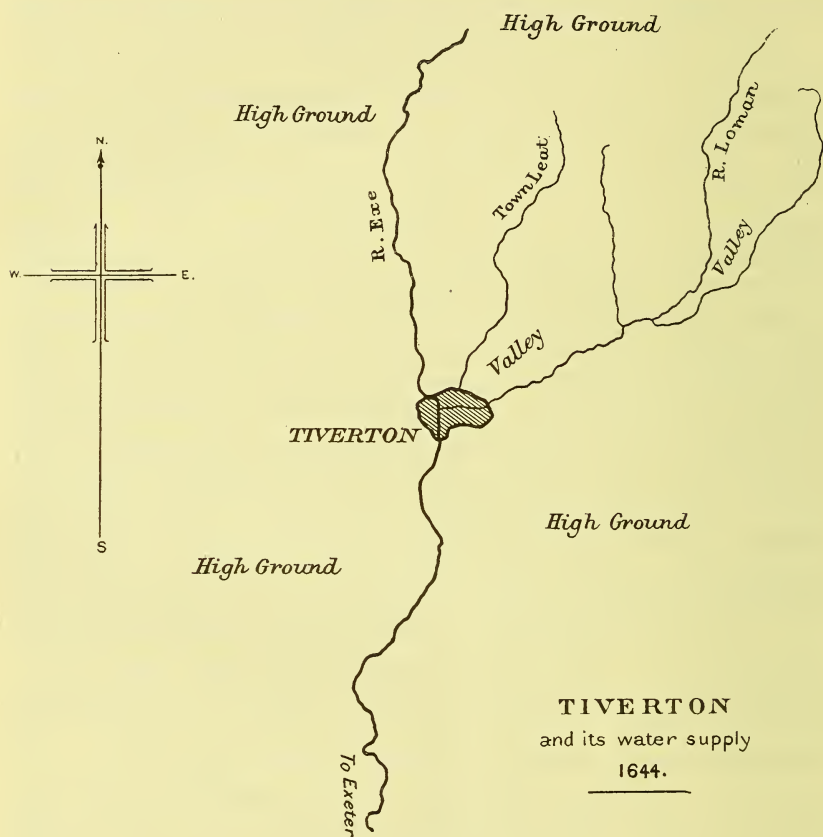


FIG. 1.

being surrounded by Royalist forces under the command of the King himself, who had made a most brilliant march from Oxford upon the heels of the Earl of Essex by a more direct route; the Parliamentary cavalry alone escaping, and the infantry having to surrender. To save his life, through having been proclaimed a traitor by the King, the Earl of Essex himself had to take boat at the port of Fowey and proceeded up the Channel to Plymouth, leaving his lieutenant, Major-general Skippon, to arrange the details of the surrender of his infantry; and so this Parliamentary army never came back through Tiverton as a whole. The surrender took place about the beginning of September. One needs

to be personally acquainted with the topography of Tiverton as well as with the history of the Civil War to appreciate all the circumstances of this dramatic episode. On the plan (Fig. 1) the roads about Tiverton are not shown for the sake of simplicity, but it may be well to state that four principal roads meet at Tiverton, one passing from north to south down the valley of the Exe from Bampton to Exeter, while another comes down the valley of the Loman from the town of Taunton in Somersetshire, and crossing the river Exe proceeds over the hills to Crediton and onwards in a south-westerly direction. It was by this latter road that the Parliamentary army came to Tiverton, and left it.

As I have already said, the force which thus brought disease to Tiverton had left the neighbourhood of Oxford on June 5, 1644. It had been the intention of the Earl of Essex to besiege Oxford, and he left his winter-quarters at Uxbridge for that purpose about the middle of May. His route took him up the Thames valley through Abingdon, and then round to the east side of Oxford, where he intended doubtless to plant batteries on the commanding heights of Shotover or Headington; but the King, on hearing of his arrival, left the town with part of his forces, probably wishing to preserve it from the damage of a bombardment, and proceeded to Worcester. The Earl of Essex then detached his lieutenant, Sir Wm. Waller, after the King, and decided upon an expedition to the south and west of England in order to relieve certain garrisons in Dorsetshire, and to support the Parliamentary partisans in Cornwall. For this purpose, with the remainder of his troops, he circled round the north side of Oxford, passing through the towns of Woodstock and Chipping Norton, and then crossed the Thames at Lechlade, where there was a suitable bridge. He thus carried his army through all the districts near Oxford which had been infected by the epidemic of the year before. The whole of this neighbourhood, in former times, depended for its water-supply upon shallow wells sunk into the superficial gravel of the Thames valley; and the whole of this soil, as we have seen, had been effectively polluted recently by the germs of what was, almost indubitably, typhoid fever. One need hardly go out of one's way to suppose that this Oxford epidemic was anything else, viewing all the circumstances as a whole, because undoubtedly enteric fever was known in England at this time as an endemic disease, and had been so described. The Parliamentary army, after crossing the Thames at Lechlade, mounted the high land formed by the chalk hills round Swindon and Marlborough, and proceeded due south by Salisbury Plain through Wilton and Blandford to Dorchester, an important Parliamentary centre. Throughout this route, after leaving the Thames, all the water-supplies are derived from the chalk and are of undoubted purity, being drawn from deep wells. An army can hardly pollute them, or be infected from them. At Dorchester a halt was made, on June 15, and detachments were sent to relieve the neighbouring towns, such as Weymouth, Wareham, and Poole, of their Royalist garrisons. All these towns passed into the possession

of the Parliament; and here another interesting figure comes upon the scene. This is the celebrated physician, Thomas Sydenham, who, as a youth of about 19, was then serving as a cornet or sub-lieutenant in a cavalry regiment commanded by his brother, Colonel William Sydenham. Colonel Sydenham, a very capable and energetic officer, was on this occasion put by the Earl of Essex into command of the town of Weymouth with a force of some 1,200 men. Having finished all this necessary business, the Earl of Essex then moved westward, driving away Prince Maurice, one of the King's nephews, from the port of Lyme Regis which he was besieging, and finally came into Devonshire by way of Axminster, Chard, and Taunton, as shown on the annexed map (Fig. 2). We have noted his arrival at Tiverton on July 5. Thus we have an instance of an army marching for a distance of nearly 100 miles, by the route taken, and not infecting, so far as we know, any one of the half-dozen towns through which it passed, in a manner resembling the occurrence at Tiverton, which practically disposes of the hypothesis of *Sudor Anglicus*. No army can thus march for a month through a number of towns without infecting any one of them, unless the disease which it carries with it is enteric fever, and thus we have before us, in this outbreak at Tiverton, an apparently classical instance of the way in which typhoid fever is carried by armies on the march, owing to the presence amongst the troops of men who are either sickening with the complaint or are convalescent from it and are still carriers of the microbe. The incidents which I have narrated could be reproduced a dozen times from the pages of military history.

To complete the interest of this narrative I should add that the Parliamentary army which entered Reading at the end of April 1643, upon its evacuation by the Royalists, was immediately affected in the same way. The troops of the Earl of Essex are described, in contemporary pamphlets, as going down with the fever by whole companies in a day. The conditions of water-supply at Reading are precisely the same as those of Oxford, or were so in former days. Both towns stand on beds of gravel by the side of the river Thames, at a point where tributary rivers enter, the tributary being the Kennet in the one case, and the Cherwell in the other, and in both instances the towns depended, until recently, for their water-supply mainly upon wells sunk into these beds of gravel. We are told by Willis and others that the spring of 1643 was extremely rainy; and the effect upon the latrines of the soldiers can be imagined. The Earl of Essex, as a consequence, had to evacuate Reading very speedily, and marched his army northwards, in the month of May, to the town of Thame on the river of the same name, which is a tributary of the Thames. Here he could menace the King at Oxford equally well; but, unfortunately, at Thame the conditions of Reading were reproduced, and the Parliamentary army continued to suffer most severely from the ravages of the epidemic, until in the month of August the Earl of Essex had to report to the Parliament that he had only 10,000 men remaining fit for duty out



FIG. 2. March of the Earl of Essex from Uxbridge to Crediton and beyond, May—July, 1644.

of the original 18,000 under his command. Of course this loss was not all due to sickness, because desertion was rampant, from the troops not being regularly paid ; but as Willis graphically remarks, for months together the two armies, Parliamentary and Royalist, were more occupied in fighting the disease than in fighting one another. Had it not been for the energy and capability shown by Dr. Greaves in getting the Oxford epidemic under control, the course of the Civil War might have been very different.

Thus we have linked together, in a most interesting way, four formidable outbreaks of what seems without doubt to have been enteric fever, in the first two years of the Civil War. Originating at Reading in an epidemic form owing to some local condition, the disease was carried to Oxford by one body of troops, and simultaneously to Thame in a different direction by another body, so that the Thames valley became thoroughly infected from Reading to Oxford and beyond. Both armies then go into winter-quarters, and a twelvemonth after the original outbreak a re-constituted army passes again, in fine summer weather, through the infected district. It marches for a whole month through some of the most healthy districts in England without finding any opportunity for leaving the seeds of an epidemic behind it, and ultimately descends upon the unfortunate town of Tiverton. Here the microbe of enteric fever finds its requirements satisfied, and, after the usual period of incubation, a tremendous epidemic breaks out and decimates the unfortunate town, whilst the army that brought the infection to the place marches on, quite unconscious of the mischief which it has done. This, one may say, is enteric fever all over. What it is to-day it was 270 years ago ; a scourge to any country which is the scene of military operations.

[Monday Afternoon, August 11]

SECTION XXIII
HISTORY OF MEDICINE
INDEPENDENT PAPER
THE HISTORY OF MEDICAL ELECTRICITY

BY DR. H. LEWIS JONES

THE applications of electricity to medicine date back for more than 150 years. No sooner had the frictional machine and the Leyden jar been discovered than they were tried for therapeutics, for it was thought that the shocks and sparks must have some potent influence. It was not long before electricity became used systematically. In 1752 Benjamin Franklin was much sought after by patients in Philadelphia; and in 1759 John Wesley, the famous preacher, published a long list of cases which he had treated by electricity. In 1777 an electrical machine was bought for the use of the patients in St. Bartholomew's Hospital, and an electrical machine was still in use there in 1818, and seems to have remained in use until 1838, if not longer. There was an electrical department at St. Thomas's Hospital at the end of the eighteenth century under the care of a surgeon, Mr. John Birch, and in Bunhill Row there was an electrical institution of which we seem only to know that it had been closed in the year 1843. Probably the institution had derived its origin from Wesley.

Few results of any value sprung from all this activity. The shocks and commotion of the discharges seem to have relieved a variety of symptoms, particularly of stiff joints, tender muscles and the like, and to have been of service in many functional nervous disorders.

It was also observed by these early experimenters that the flow of blood from a phlebotomy wound was accelerated by electrification, but they do not seem to have attached any great importance to this observation, which is nevertheless of prime value in explaining the reasons of success in many of the treatments by statical applications, as we shall see directly.

In 1836 an electrical department was founded at Guy's Hospital, and received attention from Dr. Addison, and later from Dr. (afterwards Sir William) Gull. In 1837 Addison published in the Guy's Hospital Reports a paper on 'The Influence of Electricity in certain Convulsive and Spasmodic Diseases', which may be regarded as the first scientific medical contribution of real value in the history of medical electricity in England.

It deals mainly with the effect of electrification upon chorea, and gives a detailed account of a series of cases in which the electrical treatment had exercised a profound effect in arresting this disease.

The electrical department at Guy's Hospital formed a bridge which carried medical electricity in England over the critical time which marked the abandonment of frictional or statical electricity and preceded the introduction of galvanic or voltaic electricity as a method of medical treatment, for we find Dr. Golding Bird, the medical officer in charge of the Guy's Hospital Electrical Department from its foundation, writing in 1840 and referring to both of these two modes of electrical treatment.

Golding Bird's reports are well worthy of study to-day. He is to be regarded as the first medical officer in charge of an electrical department in this country, and his work is of a high order of merit; and I wish to-day to give to his name and memory a distinguished place.

The class of case for which the statical treatment was found to be most useful, judging by the reports of Golding Bird, of Addison, and later of Gull, was that of chorea, and also of amenorrhœa in young subjects. The former gives a list of twenty-four cases of amenorrhœa, all of which were rapidly cured with the exception of four, in which there was no relief. These cases are of great value in explaining the mechanism of the electrical cures, for he distinctly states of the four failures that they were markedly chlorotic, while of most of the others he states that they were not suffering from chlorosis.

Now the chief physiological action of applications of statical electricity is an action in raising the blood-pressure. It does this, probably, by a peculiar stimulation of the surface of the skin. In chlorosis the blood-pressure is not low, and the static treatment does no good. In amenorrhœa from other forms of anæmia and debility the blood-pressure is low, and in these cases the static treatment has a good result. This I can confirm abundantly from my own experience. The essential indication for the use of statical electricity is the existence of a low blood-pressure, and all those morbid states which are associated with a low blood-pressure are benefited by static treatment, whereas the same treatment applied to persons with a high blood-pressure is very apt to cause discomfort, irritability, and failure to relieve symptoms. I now always use the measurement of blood-pressure as the guide in choosing or rejecting the use of statical electricity.

The striking good effect of statical treatment in chorea is almost certainly to be explained in this way. I have not at present any statistics as to the blood-pressure in chorea, because the good effect of statical electricity in that disease is quite unrecognized by medical men, and I am very rarely asked to use the treatment for that condition, and have not yet had opportunities of measuring the blood-pressure; but from what we know of the frequent occurrence of cardiac weakness and endocarditis in that state one may feel tolerably sure that a low blood-pressure would be found, if looked for, in that disease. I have treated

a few cases of chorea by static electricity, and with a good result. Gull, who confirmed the good effects of static treatment in chorea, has definitely expressed the opinion that it acts 'as a result of a direct stimulus to the blood-vessels of the nerve centres, producing a more tonic and vigorous circulation in them'.

The next stage in medical electricity is associated with the name of Faraday, and the discovery of induced currents of electricity. Time will not allow more than a mention of Faraday, and we must pass to Duchenne, whose ability as a neurologist led him to the employment of the induced currents (called by medical men Faradism) in the treatment of all kinds of muscular paralysis.

The influence of Duchenne has persisted to the present day, in the generally held belief that electricity has its chief valuable application in the testing and treatment of nervous disorders, a belief which has tended to retard the other uses of electricity in therapeutics.

While Duchenne was advocating the superiority of interrupted currents, another worker was patiently studying the use of direct currents, and was obtaining many successes. I refer to R. Remak of Berlin. His investigations into the treatment of many conditions, and especially in joint affections, give us a most interesting chapter in pioneer medical electricity, and one which we are only now beginning to appreciate in the light thrown upon the whole subject by the theory of ions. The work of Remak has not been sufficiently recognized.

Electrolysis, first applied by Crussel in 1832 for surgical purposes, is an important step in the employment of electricity medically. I would say a very important step, because it yields results of a perfectly definite objective character.

The weak point about so much of electro-therapy is the indefinite nature of the results. In much of it the door is open to the critic to say that the results might equally have been attained by expectant methods, without the use of electricity. With electrolysis this is not so. The effect of electrolysis upon a nævus, for instance, is immediate and visible to all, and leaves no opportunity to the sceptic to say that nothing has happened. For this reason the applications of electrolysis as a destructive agent in many surgical conditions are of prime importance as marking progress in medical electricity.

If we consider the position as it existed twenty years ago, we find that electricity was used in the following conditions :

1. General stimulation (by the static machine, or by Faradic currents) for various states of debility and mal-nutrition.
2. Localized stimulation of nerve and muscle, after the manner of Duchenne.
3. Electrolysis for the destruction of nævus, moles, hairs, &c., and in some other conditions. (Uterine fibroids by Apostoli's method.)
4. Electro-diagnosis in paralytic conditions, using the method of Erb. (1868.)

When we come to recent times the name of d'Arsonval at once commands our admiration.

D'Arsonval has given us in the high frequency current a means of utilizing electricity without muscular shock or sensation, and within the last two or three years we have begun to realize the full significance of this point. More recently Leduc has taught us to understand the mechanism of the passage of electricity through a non-metallic conductor, as is the human body, and with the data drawn from the work of Leduc and d'Arsonval we begin at last to have a proper comprehension of the real inner meaning and action of electrical currents when applied to the living organism. With this knowledge our methods and apparatus have entirely changed. We now understand that most applications of electricity to the human body act either by the transport of ions under the influence of the current—that is to say, they act chemically—or else, as is the case with currents of high frequency, the effect is thermal, and follows the heating of the tissues by the large electric currents which can be borne when they are oscillatory, and at a sufficiently high frequency. For years the high frequency apparatus was used without any clear knowledge of its mode of action, and this has been the reason why its effects were so uncertain. Now that we know that it is to be used for its thermal effects, we know how and when to employ it, so as to obtain certain definite results. In its modern form, that of the Diathermy apparatus, it is destined to render great services to medicine. High frequency currents cause no pain or shock because they are without definite ionic displacements.

Ionic medication, that is to say, electrical applications based upon the migration and movement of ions under the influence of an electric current, is concerned in all ordinary electric applications. The introduction of drugs through the skin by the electric current has already yielded very many successes. The introduction of zinc or other anti-septic ions into ulcers and sinuses leads to their rapid healing. The similar use of salicylic acid and of quinine in neuralgias and neuritis is of great benefit, and many joint affections of a chronic nature, and especially cases of ankylosis are enormously improved by the introduction of suitable ions. For the future of medical electricity we have two secure foundations in the thermal actions of high frequency currents, and in the ionic effects of the constant current.

The use of Röntgen rays for diagnosis and for treatment, and the use of radium and thorium form an annexe to electrical treatment, but are too recent to require consideration to-day. It is an interesting point to note that Crookes's experimental tubes of 1891 were generators of X-rays, but that no one had thought of looking for them, and that they therefore remained undetected until the time of Lenard and Röntgen in 1894 and 1895.

[Monday Afternoon, August 11]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

HARVEY VERSUS CÆSALPINUS: THE
CONTROVERSY CONTINUED

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SINCE the publication in the *Edinburgh Medical Journal*, August 1911, of my article, 'Harvey v. Cæsalpinus,' there has appeared a long reply by Dr. Guglielmo Bilancioni, Lecturer on General Pathology in the University of Rome. This was published in the *Archivio di Fisiologia*, vol. x, Fasc. IV, May 1912. I do not think it would be profitable to occupy time in traversing the ground covered by Dr. Bilancioni since much of it is an interpretation of passages from Cæsalpinus.

It seems to me more valuable if I point out one or two fresh pieces of evidence in favour of Harvey and against Cæsalpinus. I use the term 'fresh', for, though they cannot be called new, they have not, as far as I know, been brought before the notice of medical historians in connexion with this controversy.

The first point is perhaps the weightiest; it is a very definite comparison between Harvey and Cæsalpinus in a Latin poem composed in 1685 by Robert Grove, later Bishop of Cichester.

Dr. Weir Mitchell, in his 'Some recently discovered letters of William Harvey and some other miscellanea' (*Trans. Coll. Phys.*, Philadelphia, 1912), gives the title as follows: 'Roberti Grovii Carmen de sanguinis circuitu a Gulielmo Harvæo primum invento, adjecta sunt miscellanea quædam. Londonii, 1685.'

I have not seen a copy of this very rare poem, but I quote from Dr. Weir Mitchell's account of it.

The poem begins with a description of the discovery of the circulation of the blood spoken, as it were, by Harvey himself; Harvey then promises at another time to write 'de animalium Generatione'; he then predicts the Civil war, beholds, as in a vision, the Restoration and the founding of the Royal Society. The poem is in heroic hexameter verse, contains many Virgilian phrases and has in places a truly epic flow.

'Invoking the Muse to narrate to him the causes of arterial pulsation,

the heart beat,' &c., the author, Grove, rejoices 'that though these phenomena were not understood by the great physicians of classic times nor even by Cæsalpinus himself, yet that Harvey, the offspring of Britain, was the fortunate mortal whose name would be known for all time as the discoverer of the circulation of the blood. For this man was a most ardent investigator, enquiring into the structure and use of all parts of the body, and inspecting all the hidden seats of disease in dissected animals.' Then follows a minute description of a demonstration *in vivo* carried out by Harvey on a dog at Oxford.

Harvey was in Oxford for the best part of two years (1645 and 1646) as Warden of Merton, so that the demonstration described by Grove evidently took place about that time.

Robert Grove was born in London in 1632 and died in 1696. Although the poem was published in 1685, the author tells us in the 'Ad lectorem' that it was begun long before, but delayed in appearing owing to his ill health and his diffidence in appearing as a Latin poet. I think, then, we may take this poem as containing what was practically a contemporary judgement gratuitously expressed on this very subject of the rival claims of Harvey and Cæsalpinus to be considered as the discoverer of the circulation of the blood. Grove, a contemporary of Harvey, distinctly affirms that these vascular phenomena were not understood by the great physicians of classic times, *nor even by Cæsalpinus himself*. He writes, indeed, as though he is surprised that they were not known to so great a naturalist as Cæsalpinus, but he is in no doubt whatever that they were not.

On the other hand, he asserts that Harvey was the fortunate mortal whose name would be known for all time as the discoverer of the circulation of the blood. I submit that this contemporary opinion is entitled to as much consideration as Dr. Bilancioni's; it probably represents the judgement in University circles about the time of Harvey's death (1657). Without doubt the question as to who was the discoverer of the circulation of the blood was fully debated in learned circles in Grove's presence on many occasions before he began to compose his poem: it is the conclusion come to there that he gives us in his Latin verse.

2. The next piece of evidence, not I think previously quoted in this connexion, is the opinion of another contemporary of Harvey, Scultetus of Ulm. Scultetus was born in 1595 and died in 1645. He studied at Padua, where he is recorded as having consulted Spigelius about a surgical case. He could not long have ceased to be a student in 1628 when Harvey's book came out. Scultetus was an ardent advocate of venesection and thus interested in the blood, of which he wrote—'the blood which that new Atlas of Nature Harvey has shown to be the chief principle of the microcosm', &c. It seems to me significant that this surgeon, a student in the very country of Cæsalpinus and not an Englishman, should specifically mention Harvey and not Cæsalpinus in connexion with the subject of blood. He was nearer their time than we are.

3. The next point to which I should like to draw attention is what is said in the eulogy on Harvey inscribed above his tomb. Whoever composed that epitaph knew something of Harvey's work ; its Latinity and allusions declare it the work not of the local grave-stone cutter, but of some one possessed of information respecting Harvey's reputation. The English version of this inscription is published in no life of Harvey, as far as I know, so that I shall give the translation kindly made for me by Professor Wallace Lindsay, LL.D. of the chair of Humanity in the University of St. Andrews :

William Harvey, at the mention of whose honourable name all academies rise up out of respect, who was the first after many thousand years to discover the daily movement of the blood, and so brought health to the world and immortality to himself, who was the only one to free from false philosophy the origin and generation of animals, to whom the human race owes its acquirements of knowledge, to whom medicine owes its very existence, &c.

This, then, may be taken as still another expression of contemporary opinion. The inscription which I have copied is carved in stone below the bust of Harvey on the west wall of the north transept of the church at Hempstead in Essex where Harvey was buried. It must have been composed by some one who knew the chief features of his life and work ; since it alludes to his building and endowing the library of the College of Physicians, it may quite possibly have been written by his intimate friend, Sir George Ent, the President, to whom he entrusted the publication of the *De Generatione*. But whoever wrote it lived nearer Harvey's and Cæsalpinus's time than we do, and his opinion very probably represents the opinion of the learned men in England at that date. It is expert opinion in the sense that it is the pronouncement of a man who knew Harvey's achievements, both in general biology and in medicine, and it is in the tone of a person speaking with authority and in the belief that what he says is universally admitted.

4. We might now take up the objection about Harvey not quoting from Cæsalpinus.

In my paper I said : ' Professor Luciani blames Harvey for not quoting from Cæsalpinus, and indeed for ignoring his work. But seeing that Harvey quotes a large number of ancient and contemporary writers, the natural inference is that he found nothing in Cæsalpinus of a helpful nature to quote.'

I am confirmed in the view that this was the case, by having re-read very carefully Dr. Ent's last interview with Harvey (1650). Ent communicated the substance of this interview to the College of Physicians, for he had to inform them of his being entrusted with the publication of the *De Generatione*. Ent wrote : ' We have evidence of his singular candour in this, that he never hostilely attacks any previous writer, but ever courteously sets down and comments upon the opinions of each. . . . It would have been easy for our illustrious colleague to have woven

the whole of this web from materials of his own, but to escape the charge of envy he has rather chosen to take Aristotle and Fabricius of Aquapendente as his guides, and to appear as contributing but his portion to the general fabric. Of him whose virtue, candour and genius are so well known to you all, I shall say no more.' This is the statement of a man who knew Harvey intimately in his closing years, and it is not calculated to make us believe that Harvey was the kind of man to pass over deliberately any forerunner who had contributed anything germane to his subject. Ent, his friend, specifically speaks of his candour. Professor Ceradini, 220 years later, makes the specific charge that Harvey was so singularly lacking in candour that, having learned of the circulation in Italy from the writings of Cæsalpinus, he purposely delayed publishing it as his own discovery until Cæsalpinus had been dead 25 years.

The Italian suggestion—for it is more than an implication—is that Harvey was dishonest. Now this is an inference from very questionable data; over against it we have to put the evidence as to his character from men who knew him in the flesh. That he was hot-tempered, impatient, and outspoken there seems no doubt, but that he was a sneak, no contemporary, qualified to express an opinion, has ever indicated.

It is an insolent and gratuitous assumption to assert that Harvey was a plagiarist. I ask again, 'Why should Harvey have been the only man to learn of the circulation from Cæsalpinus?' Cæsalpinus founded no school, he raised no controversies, he encountered no resistance—a very bloodless victory for so great a discovery!

But, as a matter of fact, Professor Luciani in his *Text-Book of Physiology* quotes only one writer, Isaac Voss, who gave Cæsalpinus the credit of the discovery. Voss, who was born in 1618 and died in 1688 and therefore not a contemporary of Cæsalpinus, was a classical scholar and for a time Professor of History at Amsterdam.

Voss was no student of physiology, but Descartes, Harvey's contemporary, was; what he wrote of Harvey is too well known to quote, and Descartes was not a man prone to give other people credit for discoveries. But as I have pointed out, there is no unanimity of Italian opinion on the subject of the discovery of the circulation.¹

Professor Luciani names no fewer than five authors who hailed Fra Paulo Sarpi as the discoverer of the circulation. A tablet has been erected in the Veterinary School at Bologna stating that Ruini was the discoverer.

Certain Spaniards will even claim that Servetus discovered the circulation of the blood because he wrote that the cardiac septum was not permeable and that the blood travelled from the right to the left side via the pulmonary artery.

We must allow a very great deal of weight to the expression of con-

¹ Bayle, writing in the eighteenth century, says that Cæsalpinus knew of the circulation. He says the proofs are very plain, but he mentions none.

temporary opinion: all the following, who were contemporaries of Harvey, recognized him as the discoverer of the circulation: Hobbes the philosopher, Hooke (of the *Micrographia*), Robert Grove, Sir George Ent, the writer of the epitaph, the Hon. Robert Boyle, and Aubrey the antiquary.

On the continent of Europe the following professors of anatomy or physicians adopted the doctrine of the circulation of the blood as definitely Harveian, viz.: Bartholinus of Copenhagen, Leroy of Utrecht, Pecquet of Dieppe, Slegel of Hamburg, Sylvius of Leyden, Scultetus of Ulm, Trullius of Rome, Walæus of Leyden, Wolfink of Jena.

Swammerdam wrote, 'the incomparable Harvey': while Bartholinus, Descartes, and Haller definitely acknowledged Harvey the discoverer.

5. Finally I should like to point out that the theory that Harvey learned of the circulation from Cæsalpinus in Italy did not originate with Professor Ceradini, but was virtually concocted by one Henry Stubbs or Stubbe, a native of Lincolnshire, who was born in 1632 and died in 1676. Stubbs was a physician and writer of polemics who seemed for some years to have lived in order to disparage the Royal Society.

The work in which Stubbs minimizes the value of Harvey's work is entitled: *Legends no histories or a specimen of some animadversions upon the History of the Royal Society*. London, 1670.

Isaac Disraeli in his *Calamities and Quarrels of Authors* has given some account of this subject. Briefly, it is in essence the modern Italian view; Disraeli's words are—'Harvey published his Treatise at Frankfort in 1628, but Cæsalpinus's work appeared in 1593. Harvey adopted the notion and more fully and perspicuously proved it.' Stubbs's words were—'Harvey in his two answers to Riolan nowhere asserts the invention so to himself, as to deny that he had the intimation or notion from Cæsalpinus, and his silence I take for a tacit confession. His ambition of glory made him willing to be thought the author of a paradox he had so illustrated and brought upon the stage where it lay unregarded, and in all probability buried in oblivion, yet such was his modesty as not to vindicate it to himself by telling a lie.'

In order to assess the value of this passage we must first of all remember that it occurs in a work expressly designed to detract from the merits of the Fellows of the Royal Society, and of other English men of science. Although Harvey was not a Fellow of the Royal Society in the sense that he died before it got its charter, he was undoubtedly one of that band of searchers after truth through whose labours the Society came into being.

It has been suggested that Stubbs did not write from conviction, but as an anti-royalist and to please his patron Sir H. Vane. He attacks indiscriminately all followers of science in England and pours contempt on all their claims to fame. What he says of Harvey is apparently the worst he has to say of him.

Now there is some evidence that Stubbs was not qualified to be a judge in this controversy at all.

He commits himself to the following statements or implications in addition to the main charge of dishonesty :

1. That Harvey was ambitious of glory.
2. That his discovery lay unregarded and buried in oblivion.

A very superficial acquaintance with Harvey's life is sufficient to show us that it was not ambition, a love of fame, but a love of truth that made him publish in book form the discovery he had been teaching for a dozen years or so previously.

He said that he had gone to work 'in order that what is false may be set right by dissection, multiplied experience and accurate observation'; and again, 'I thought I had attained to the truth'; and still further, 'my trust is in the love of truth and in the candour of cultivated minds.' Are these the utterances of a man merely seeking fame?

In the next place it is not historically true that Harvey's discovery 'lay unregarded and buried in oblivion'. Notoriously the opposite was true. Harvey told Ent that he had not published his *De Generatione*, because of the hubbub raised by the *De Motu*. Ent quoting Harvey in his letter to the College of Physicians wrote: 'I know full well what a storm my former lucubrations raised.' To this Ent replied, 'True; it is the usual reward of virtue to have received ill for having merited well. But the winds which raised these storms, like the north-western blast which drowns itself in its own rain, have only drawn mischief on themselves.'

When one who knew Harvey intimately said that his discovery raised a storm, and when one who was his confessed detractor said it lay unregarded and buried, we ought not to be in any doubt as to whom to believe.

Stubbs, having been thoroughly discredited in the matter of the public reception of the *De Motu*, cannot pose as a trustworthy authority on the question where Harvey got the materials for his work. Harvey and Ent say he got them *not* from the writings of any man. Stubbs says he got them from the writings of an Italian published in 1593. There seems no room for hesitation whom to believe.

The Italian theory is, therefore, not new; it is in essence the theory of an English writer hostile to English science, who was quite unqualified to pass any opinion on the subject of the controversy, Harvey versus Cæsalpinus.

[Monday Afternoon, August 11]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

ALTGRIECHISCHE HEILVOTIVE VOM ÄRZTLICHEN
STANDPUNKTE

VON DR. OSKAR V. HOVORKA, WIEN

VOR mehreren Jahren hat Stieda in glanzvoller Weise die altitalischen Votivgaben bearbeitet und Wechselbeziehungen zwischen der Geschichte der Medizin und den verwandten Disziplinen aufgedeckt, für welche ihm unsere Wissenschaft sicherlich Dank schuldet. Es ist naheliegend, dass der Wunsch, *auch die altgriechischen Votive* in ähnlicher Weise zu beleuchten, sich gewissermassen von selbst ergibt. Allerdings ist das Material wegen seiner grossen Reichhaltigkeit noch lange nicht einheitlich gesammelt und es wird sicherlich noch einer emsigen, jahrelangen Arbeit bedürfen, bis dies der Fall sein wird. Ich habe es nun versucht, mich in diesem Wirrwarr wenigstens allgemein zu orientieren, und möchte mir erlauben, als Pfadfinder eine Auswahl dieser Votive vorzulegen, um zu zeigen, inwieweit das epigraphisch-archäologische Material Beachtung auch seitens der Aerzte verdient.

In erster Linie fällt hier ins Gesicht die Berücksichtigung der Tituli Asiae Minoris, deren Führung dem Prof. Dr. Oehler in Wien obliegt.¹ Wenn wir nun nach den Krankheiten fragen, auf welche sich die Votive beziehen, so ersehen wir aus dem reichhaltigen Material, dass es nach dem Sitze vorzüglich die Augen, Ohren, Brüste, Füsse und Hände, sowie Genitalien sind, welche den Inhalt der Votive bilden. Und zwar sind es besonders Frauen, von welchen derlei Votive herrühren. Einen interessanten Diskussionspunkt bildet hier die Frage, ob sich die zahlreich vorliegenden Abbildungen auf geheilte oder kranke Glieder beziehen. Während nämlich Körte² der Ansicht hinneigt, dass sich die Votive auf Nachbildungen geheilter Glieder beziehen, gibt Stieda der Meinung Ausdruck, dass die Votive Nachbildungen kranker Glieder darstellen.³ Wir wollen gleich an dieser Stelle ausdrücklich erklären, dass wir uns

¹ Siehe dessen *Epigraphische Beiträge zur Geschichte des Aerztestandes im Janus*.

² A. Körte, 'Bezirk eines Heilgottes,' *Mitteilungen des Kaiserlich Deutschen Instituts, Athen*, Bd. xviii, 1893, 231-56, Tafel XI.

³ Stieda, 'Über altitalische Weihgeschenke,' *Röm. Mitt.*, xiv, 1910.

weder der einen noch der anderen Ansicht anschliessen können, denn wer sich einigermaßen mit der modernen Volksmedizin beschäftigt hat, wird uns ohne weiteres zugeben, dass eine solche Fragestellung vollkommen missig ist; es denkt ja weder der Kranke noch der darstellende Künstler an den feinen Unterschied zwischen 'normal' und 'pathologisch'. Der Kranke nicht, weil er der Gottheit den Wunsch oder den Dank sinnfällig darbringen will, welcher sich auf seine Krankheit bezieht; der Künstler nicht, weil er nur den Auftrag über den Körperteil im Sinne hat, welcher bei seiner Kundschaft erkrankt ist. Abgesehen davon, dass es sich in der überwiegenden Anzahl der Fälle nicht etwa um wahre Künstler, sondern vielfach um Halbkünstler, oder nur Handwerker, ja sogar um Afterhandwerker handelt, dürfte dem Verfertiger der Votive wohl nur selten jener Unterschied zum Bewusstsein gekommen sein. Es darf uns daher kaum wundern, dass es zumeist ganz rohe Darstellungen gesunder Augen, Ohren etc. sind, und dass nebenbei auch Darstellungen pathologischer Erkrankungen vorkommen. Die letzteren müssen allerdings schon sehr augenfällig sein, wie wir dies z. B. an der Körte'schen Publikation des varikösen Schenkels ersehen. Auch die modernen Votivgaben, wie wir sie vor den heutigen Kirchen in den Alpenländern zum Kaufe angeboten sehen, sind zumeist ganz rohe Nachbildungen aus Wachs, Blei, Holz, Silber u.s.w. und werden vorrätig gehalten, ohne dass es dem Verfertiger jemals im Traume eingefallen wäre, eine bestimmte Krankheit zur Darstellung zu bringen.

Was das Material an und für sich betrifft, so müssen wir wohl zwischen den archäologischen und epigraphischen Belegen unterscheiden. Es finden sich nämlich Votive allein ohne Inschrift und solche mit Inschrift. So begegnen wir bemerkenswerten archäologischen Funden in erster Linie in den im Altertum so berühmten Heilorten. Wir wollen als Beispiel anführen Petsofa auf Kreta,¹ welches bereits aus der mykenischen Zeit, also aus dem zweiten vorchristlichen Jahrtausend stammt. Es finden sich hier Votivfigürchen von Armen, Beinen und Köpfen, auch Genitalien, sowie ganzen Gestalten; viele von ihnen sind zum Aufhängen hergerichtet.

Auch in dem auf dem Südabhange der Akropolis entdeckten Asklepiosheiligtum,² welches aus der historischen Zeit stammt, finden wir 92 Reliefs und 13 Inschriften, und zwar beziehen sich die ersteren auf die Adoration (*προσευχή*) und auf das Opfer (*θυσία*). Die verschiedenen Darstellungen haben zum Inhalt die Krankenheilung durch Asklepios; neben ihm tritt jedoch auch Hygieia, Machaon, Demeter und Kore u.s.w. auf. Von den Inschriften ist besonders zu erwähnen eine Opferszene der Aerzte an Aeskulap und Hygieia,³ ferner getreue Abbildungen des Kultes;⁴ alle diese Votive sind wohl auf die Zeit von etwa 343 bis 200 v. Chr. zurückzuführen.

¹ *The Annual of the British School at Athens*, ix (1902-3), S. 356, 'Palaiokastro: The Sanctuary of Petsofa (Kreta)'.

² *Bull. de corr. hell.*, ii (1878), pp. 65-94, P. Girard: 'Ex-voto à Æsculape trouvés sur la pente méridionale de l'Acropole.'

³ *Loc. cit.*, p. 89.

⁴ *Loc. cit.*, p. 93.

Ein ziemlich vollständiges Inventar des Asklepieheiligtums verdanken wir der Arbeit von Martha und Girard,¹ welche sich auf Heilvotive bezieht, die aus den Jahren 307 bis 266 v. Chr. stammen. Wir finden hier neben Votiven auch ärztliche Instrumente, welche sicherlich bei der Genesung eine Rolle spielten und wahrscheinlich mitgeopfert wurden, 50 z. B. σιδηροῦς δακτύλιος—καθετὴρ ὑάλινος,² oder (13) δακτύλιος σάρδιον χρυσῶι ἐνδεδεμένον ὃ ἀνέθηκεν Ὀνήτωρ ἰατρός (Goldring mit Edelstein, eingefasst, welchen der Arzt Onetor weihte), ferner σῶμα καταμακτὸν γυναικὸς ὃ ἀνέθηκεν Πανσιμάχη; oder ὀφθαλμοὺς ἀνεπίγραφος (Auge ohne Aufschrift); οὓς καταμακτὸν; ὅτα δύο καταμακτά; σκέλος (Schienbein); ὅτα δύο καὶ ὀδόντες, οὓς ἀνέθηκεν Ἀρισταγόρα (Zahnvotive sind bekanntlich ziemlich selten); σῶμα ἀνδρὸς . . . ἀνέθηκε Σωσίβιος;³ χεῖρα ἀργυρᾶν, ἣν ἀνέθηκε Γλυκέρα; σκέλη δύο καὶ χεῖρ; δάκτυλος κοῖλος (hohl); ὀφθαλμοὶ ἃ ἀνέθηκε Μαρμμία ἐπιχρύσους. Χεῖρ χρυσῇ καὶ ἀργυρᾷ καὶ χαλκῇ καὶ λιθίνῃ ἣν ἀνέθηκε Φιλίππη. Man ersieht aus dieser Zusammenstellung, dass das Material, aus welchem die Votivhand angefertigt wurde, aus Gold, Silber, Bronze und Stein bestand.

Δύο ἔνε ὀφθαλμοὶ χρυσοῦς καὶ ἀργυροῦς καὶ ὀφίδιον (Schlange) χρυσοῖν ἃ ἀνέθηκεν Ἡδύτιον (ein Frauennamen); τιτθία (Brustwarzen) δύο; auch τιτθὸς Νικοστράτης. Αἰδοῖον (Genitale) ὑπὲρ Μενεκλέους. p. 430 f. ἐξάλειπτρον (Salbenbüchse) ὑάλινον.

Girard unterscheidet in seinem beschreibenden Katalog der Asklepiosvotive⁴ vier Arten der letzteren: 1. Votive der Supplikation (Nr. 1–34); 2. Votive, auf welchen Asklepios allein oder mit der Hygieia dargestellt ist (35–60); 3. Supplikanten ohne Gottheit (61–78); 4. Verschiedenes. Es ergibt sich hieraus, dass das Material an Votiven nicht nur recht reichhaltig, sondern auch verschiedenartig war. Es wiegen besonders Augen, Ohren, Finger, Hände, Füße vor, doch treffen wir auch seltenere Körperteile, z. B. Schienbeine, Genitalien, Brustwarzen u.s.w., mitunter auch ganze Menschengestalten kunterbunt an. Dazwischen findet man auch ärztliche Gerätschaften, wie z. B. Glaskatheter und Salbentiegel, mit deren Hilfe der Kranke die verloren gegangene Gesundheit wiedererlangt hatte und sich beeilte, dieselben der Gottheit als Opfer darzubringen.

Das bekannteste Heilvotiv, welches pathologische Zustände eines Körperteils darzustellen scheint, ist das von Körte aus dem Bezirke eines Heilgottes publizierte Kolossalbein, auf welchem stark hervortretende variköse Blutadern (Venen) sichtbar sind.⁵ Es ist bekannt, dass 'Krampfadern' nicht leicht heilbar und schwer zum Verschwinden zu bringen sind; ferner, dass sie die Ursache für die gefürchteten und vielfach als unheilbar geltenden 'Unterschenkelgeschwüre' abgeben. Es erscheint uns nun durchaus nicht auffallend, dass ein solcher etwa

¹ J. Martha u. P. Girard, 'Inventaires de l'Asklépiéion,' *Bull. de corr. hell.*, ii. (1877), 419–45, cf. *Ἀθήναιον*, v. 203 u. 289.

² Loc. cit., p. 421, 9.

³ Loc. cit., 26.

⁴ *Bull. de corr. hell.*, i (1876), 156–69; P. Girard: 'Catalogue descriptif des ex-voto à Æsculape.'

⁵ Körte, 'Bezirk eines Heilgottes,' *Ath. Mitt.*, xviii (1893), 231 f., Taf. XI.

zur Heilung gelangter Fall grosses Aufsehen erregt haben muss; ebenso wenig, dass der beauftragte Künstler es nicht unterliess, eine so auffallende Krankheitsursache zur Darstellung zu bringen.

Von demselben Orte stammt auch eine Marmorplatte (241, 6) mit weiblicher Brust in hohem Relief; unter ihr ist die Inschrift angebracht Ἡδεῖα (Name) Ἀσκληπιῶ; sie stammt aus dem dritten Jahrhundert v. Chr.; ferner eine Marmorplatte mit männlichen Genitalien in Relief (Nr. 7), sowie eine solche mit zwei Ohren (Nr. 8), dann die beiden vorderen Glieder eines Fingers, wohl einzeln geweiht.

Eine Reihe ähnlicher Beispiele wäre noch von einer ganzen Anzahl anderer Orte anzuführen, doch wollen wir hier auf die weitere detaillierte Beschreibung verzichten und uns nur auf die Angabe der wichtigsten Quellen beschränken.

Wir wollen vorerst auf die zwei griechischen Votivstelen aus Lydien hinweisen, welche ich bei der Naturforscherversammlung zu Münster¹ 1913 ausführlich besprochen und deren bisher unbekannte photographische Abbildungen ich demonstriert habe. Aus Golgos² stammt ferner eine Anzahl von Platten und Reliefs mit Inschriften, welche vorzüglich Brüste, Augen und männliche Glieder enthalten; auch ist ihnen eine Pferdezeichnung beigelegt.

In der Sammlung des Herzogs von Bedford (in der Woburn Abbey)³ findet sich ein Weihrelief εὐχαριστήριον einer Frau; es handelt sich hier offenbar um die Heilung eines Ohrenübels. Ueber den abgebildeten Ohren erhebt sich je eine Schlange des Heilgottes und hinter jeder Schlange ist eine Pflanze dargestellt, welche dem rätselhaften *Silphion* der kyrenischen Münzen sehr ähnlich sieht. Es ist sehr wahrscheinlich, dass sie die Abbildung des bei der Ohrenkrankheit verwendeten Heilmittels darstellt.

Auch in dem bekannten Asklepiosheiligtum Epidauros fanden sich viele Ohrenvotive.⁴ Aus Pergamon stammen eine Votivhand und Votivbrüste, dann eine Votivplatte mit einem Ohr in flachem Relief.⁵

Hogarth⁶ erklärt Ohren und Augen, welche zu Ephesos gefunden worden sind, für Amulette, Weinreich dagegen als kleine Appliken; sie waren aus Goldblech verfertigt; dabei befanden sich Abbildungen von Händen und Füßen. Ähnlich verhalten sich die Funde von Golgos auf Kypros.⁷ Zwei Bronzohren aus Delphi, welche die Inschrift Ἀναξίλα Ἀσκληπιῶ tragen, weisen noch Einlassspuren auf. Auch bei Weinreich

¹ v. Hovorka, 'Zwei griechische Votivstelen aus Lydien,' *Wien. med. Woch.*, 1913, No. 15.

² *Bull. de corr. hell.*, xx, pp. 361 u. 363; P. Perdrizet: 'Un sanctuaire de dieu guérisseur à Golgos (Larnaca).' Andere Heilvotive, vgl. *Bull. de corr. hell.*, iii. 167.

³ *Arch. Anz.*, 1864, S. 213, Taf. A 1.

⁴ *C. I. Lat.*, iii. 7266, Dessau 3853 (s. *Ἐφ. ἀρχ.*, 1885, p. 199).

⁵ *Altentümer von Pergamon*, vii. 266, Nr. 337.

⁶ Hogarth, *Excavations at Ephesos*, 1908, Taf. VII, 107 u. 108.

⁷ *Bull. de corr. hell.*, xx. 360 f.

findet sich eine grosse Anzahl von Heilvotiven, welche zumeist aus dem Asklepieion zu Athen stammen.¹

Wir haben bis nun immer nur von Votiven gesprochen, welche dem Asklepios oder der Hygieia geweiht waren. Fragen wir uns nun, ob es auch andere Gottheiten gab, denen man Votive weihte. Es ist ja bekannt, dass z. B. in den Alpenländern der Jetztzeit, woselbst wir bezüglich der Heilvotive beinahe auf eine vollkommene Analogie mit jenen des Altertums stossen, nicht ein einziger, sondern mehrere Heilige in Betracht kommen. So erfreut sich z. B. in Wien der hl. Peregrin eines besonderen Vertrauens seitens der Bevölkerung bei Fussleiden, der hl. Valentin in Bayern bei der Epilepsie, der hl. Augustin und die hl. Ottilie bei Augenkrankheiten, der hl. Blasius wird besonders von Halskranken in Anspruch genommen; die hl. Apollonia, welche die Zange trägt, rufen mit Vorliebe die Zahnleidenden an. In ähnlicher Weise hat es auch bei den Griechen eine Reihe von Göttern gegeben, denen die Kranken oder Genesenen ihre Votive weihten.

In erster Linie war es Demeter, welcher Heilvotive dargebracht worden sind. Als typisches Beispiel wollen wir nur das bekannte Basrelief aus Philippopolis anführen: Σ]τρατία ὑπὲρ τῆς ὀράσεως (Gesicht) θεᾶ Δήμητρι δῶρον.²

Eine nicht selten genannte Gottheit ist die Anaitis, welche besonders häufig in Maionien vorkommt. Ihre Bedeutung und ihr Zusammenreffen mit den Men-Gottheiten habe ich gelegentlich der Besprechung der lydischen Votivstelen ausführlich besprochen.³ Sie ist mit der grossen vorderasiatischen Göttin identisch, welche bald den Namen Artemis, bald Μήτηρ führt. Men ist der phrygische Mondgott, welchem verschiedene Personennamen, z. B. Μῆν Τιάμον, Φαρνάκον, Ὀξύθρονον, Οὐράνιον, Ἀρτεμιδόρον, Κάρον nachgesetzt werden.

Der auf einem Relief aus Kypros erwähnte Theos Hypsistos ⁴ (Θεῷ ὑψίστῳ ἀνέθηκεν Πρόκτος ἐξαμένη) scheint nach Analogie einer aus Athen stammenden Inschrift ein Zuname des Zeus gewesen zu sein.⁵

Wir können zum Schlusse eine zwar nicht griechische, doch auf römischen Votiven um so häufiger vorkommende Göttin nicht unerwähnt lassen; es ist dies die Bona Dea, die Frau oder Tochter des Faunus, welche auch den Namen Damia führt und als Erdgöttin sowie Geburtsgöttin verehrt wurde. Nach Roscher ist sie mit der Hygieia identisch.⁶ In ihrem Tempel zu Rom befand sich eine Apotheke, aus der die Priesterinnen, also Aerztinnen, Heilmittel verabreichten; ihr Symbol war die Schlange. Da sie auch Augenleiden heilte, wurde sie oft auch *Dea oculata* (d. h. *oculata*) genannt; auf Befreiung von einem Ohrenübel

¹ Weinreich, *Athen. Mitt.*, xxxvii (1912), S. 1–68.

² *Annali*, 1861, 380 f., Taf. V.

³ Loc. cit., p. 3.

⁴ P. Perdrizet, loc. cit.

⁵ *Annali*, 1843, p. 330, K. III, 148 f., 237–8; 'Berliner Skulpturen,' Nr. 718–21.

⁶ Roscher, *Lexikon der griech. u. röm. Mythologie*, i. 943.

bezieht sich das Votiv der Bonae Deae auritae.¹ In ähnlicher Weise zu erklären sind die Beinamen Lucifera (Geburtsgöttin?) und Restituta (Wiederherstellerin).

Es ist auffallend, dass sich eines der Votive unter den Votivstelen des klassischen Altertums in Kleinasien und Griechenland bisher nicht vorfand. Es ist dies die Darstellung der Gebärmutter als Kröte, wie sie in unsern Alpenländern noch heute so häufig ist. Allerdings ist ein Krötenamulett aus dem Grabe eines römischen Provinzialen bei Säubersdorf, Oberpfalz, bekannt, welches sich im Historischen Museum zu Tölz befindet und in seiner Ausführung den jetzigen Krötenvotiven derselben Gegend vollkommen gleicht.²

Wenn wir nun das bisher Gesagte kurz zusammenfassen wollen, so müssen wir hervorheben, dass die meisten uns bisher bekannten griechischen Heilvotive aus Stein verfertigt waren; daneben gab es auch solche aus anderem Material, z. B. aus Holz oder Metall u.s.w. Es ist uns z. B. von einer Hetaere die Nachricht überliefert worden, welche darauf hindeutet, dass dieselbe von andern Frauen mit hölzernen Heilvotiven erschlagen worden sei. Die Heilvotive führten im Altertum den Namen *ἱεροποιήματα, ἀνάθημα, στήλη*. Wie ein roter Faden zieht sich bei deren Aufstellung der Dank für die *ὁλοκληρία*, d. h. Vollständigkeit, Unversehrtheit und Wiederherstellung der Gesundheit, oder einzelner Glieder des Opfernden. Die am häufigsten abgebildeten Glieder sind: Augen, Ohren, Brüste, Hände, Füße, männliche Geschlechtsteile; seltener findet man Abbildungen von Brustwarzen, Zähnen, Fingern und Finger- oder Zehengliedern. Ihre gewöhnlichsten Fundorte sind die Asklepiosheiligtümer des Altertums, doch auch solche anderer Gottheiten, und gerade darin finden wir eine zwar auffallende, aber durch den Gegenstand selbst leicht erklärliche Kontinuität und Analogie bis in unsere heutigen Tage.

¹ C. T. L. 759; cf. Friedl., iii. 8.

² v. Hovorka-Kronfeld, *Vergleichende Volksmedizin*, Bd. i, S. 262.

[Monday Afternoon, August 11]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

HINDU MEDICINE

BY S. M. MITRA, AUTHOR OF 'LIFE OF SIR JOHN HALL, K.C.B., PRINCIPAL MEDICAL OFFICER OF THE CRIMEA', 'INDIAN PROBLEMS', 'ANGLO-INDIAN STUDIES', 'HINDUPORE', ETC., AND JOINT-AUTHOR WITH HER HIGHNESS THE MAHARANI OF BARODA OF 'THE POSITION OF WOMEN IN INDIAN LIFE'

To those who believe in the hereditary transmission of talent it may be interesting to note that the profession of physician is almost always handed down in Hindu India from father to son, and whether a man may practise Hindu medicine depends on his caste. In India a man must first be born in the physician caste before he may practise Hindu medicine, unless he be a Sadhu or religious mendicant.

To the Hindu the universe is no mere fortuitous concourse of atoms, but a cosmos capable of consistent explanation, a mighty whole of which human beings are one part. The Hindu physician did not study medicine as an isolated art, but as a branch of, and in connexion with, the science of the universe, and to his idea philosophy, science, and religion have always been inextricably interwoven.

A proper work on Hindu medicine has yet to be written. Wilson's essays in the *Oriental Magazine* (1823), Royle's *Antiquity of Hindu Medicine* (1837), and Wise on *Hindu System of Medicine* (1845), drew the attention of Europe to the medical system of India. In recent years *A Short History of Aryan Medical Science* by the Thakur Sahib of Gondal, *Hindu Materia Medica* by U. C. Datta, and a pamphlet on Hindu medicine by Dr. J. D. Comrie, of Edinburgh, have spread knowledge of Hindu medicine in the West. But I believe this is the first time that Hindu medicine has figured before the International Congress of Medicine. The oldest medical book of the Hindus is called the Ayur Veda, or 'The Science of Life', and is founded on the Rig Veda, and on the Atharva Veda.

Hindu medical science teaches that there are three all-pervading humours or forces in the body—Vayu, Pitta, and Kafa or Slesma—and that while these humours are in proper equilibrium the body remains in health. Vayu, or vital force, is of five kinds: (1) Prana, by means of which

men breathe and swallow ; (2) Udana, by which men utter sounds ; (3) Samana, in the stomach, by which the nutritive part of the food eaten is resolved into a liquid and divided from its waste products ; (4) Apana, by which the waste products are ejected from the body ; and (5) Vyana, which acts throughout the body, and transports its fluids. The body is caused to live and move by means of these vital 'winds' or 'airs', as they are often called for lack of a better translation in English, though in reality something much more subtle is implied in the Hindu term. These five 'airs' and their connexion with the processes of digestion and circulation are all described repeatedly in the Mahabharata, that huge encyclopædic epic of Hinduism, which was composed about 1500 B. C.

The movement of the blood is thus described in the Mahabharata : 'The ducts leading from the heart go up, down, and in transverse directions ; they transport the best juices of the food.'¹ Also : 'Impelled by the ten kinds of breaths . . . the ducts leading from the heart transport the liquid juices yielded by food up, down, and in cross directions.'² This knowledge of the Hindus dates from about the seventeenth century before Christ.

The second humour, Pitta, often wrongly translated 'bile', produces animal heat, and is also of five kinds : (1) Pachaka, which aids digestion and divides the nutritive liquid, into which the food has been resolved, from the waste products ; (2) Ranjaka, in the spleen and liver, imparts a red colour to the juices into which the food has been resolved ; (3) Sadhaka, situated in the heart, indirectly promoting the cognitive functions ; (4) Alochaka, situated in the eyes, producing vision ; and (5) Bhrajaka, promoting excretions from the skin.

The third humour, Kafa or Slesma, is likewise of five kinds : (1) Kle-dana, in the stomach, where it serves to moisten the food ; (2) Avalambana, in the heart, shoulder-joints, and sterno-clavicular joints ; (3) Rasana, in the throat and tongue, where it keeps these parts moist and imparts the sense of taste ; (4) Snehana, in the head, where it invigorates the organs of sense ; and (5) Shleshana, in the joints, which are thereby made to move easily. In addition to the three humours, the Hindu theory of medicine recognizes seven other constituents of the body : lymph-chyle (Rasa), blood (Rakta), flesh (Mansa), fat (Medas), bone (Asthi), marrow (Majja), and semen (Shukra). It will thus be seen that the humoral theory of the Hindus bears an extraordinarily close likeness to that of Hippocrates. The idea that the Hindus derived their humoral theory from Hippocrates is untenable, for a perusal of the Rig Veda will establish the fact that reference is therein made to the three humours. Now the Rig Veda was composed about 2400 B. C., hence the humoral theory of disease is as old as the oldest literature of the Aryans, about 2,000 years before the birth of Hippocrates. In the Mahabharata, too, we read : 'Cold, heat, and

¹ Vana Parva, ccxii.

² Santi Parva, clxxxv.

wind, these three are the body's attributes. Their presence in harmony is the mark of health.'¹ Hippocrates supposed that there were four cardinal humours, formed from the four elements of which the body is composed. The ancient Hindus, on the other hand, recognized five elements : earth, air, fire, water, and space or ether, and three humours. Like the Hindus, Hippocrates believed that 'the humours are liable to undergo change ; that health consists in their right constitution and proper adjustment as to quantity ; disease, in their impurities and inequalities. . . . The primitive disturbance of the humours he attributed to a great variety of causes, chiefly to the influence of surrounding physical circumstances, such as heat, cold, air, water.'² The fact is that Hippocrates, instead of being the teacher of the Hindus, was most likely their pupil.

So much for the originality of the theory which forms the basis of Hindu medical treatment. Now let us see what my countrymen have done in the region of *Materia Medica*. The Hindu *Materia Medica* is drawn from each of the three kingdoms of nature, and since within the bounds of India there is an astonishing variety of soil and climate, the list of plants and minerals used in Hindu medicine is a voluminous and in many ways a peculiar one. Hindu physicians have studied the effect of the seasons upon plants, the various localities and circumstances in which the latter most fully develop their distinctive properties, the influence upon them of the sun and moon, the time they take to grow, and the exact period at which they should be gathered. Having thus reduced to a science the conditions under which the particular medicinal qualities of each plant can best mature, they have studied the methods of extracting their special properties, and have classified them in different ways. They consider medicines to be either hot or cold in power (*Veerya*) according to the influence of the sun or moon.

This hot and cold theory of medicine was also developed by the Greek physician Galen, who may have derived it from India. According to the Hindus, the seasons from January to June are those during which the sun exerts a less beneficial influence upon the plant-world, sucking up its juices, and giving it heating properties. On the other hand, from July to December the sun's rays produce a cooling effect on plants. These solar periods are known as *Uttara Ayana* and *Dakshina Ayana*. The variations of the vegetable world caused by the light of the moon have also been carefully observed by Hindu scientists on dark and bright nights, and Hindus of the higher classes attach such importance to the lunar mansions (*Nakshatra*) that they regulate their diet accordingly, eating certain vegetables only at certain phases of the moon. In India the moon's rays are so powerful that they are an important and peculiar

¹ *Santi Parva*, xvi. 11.

² *History of the Intellectual Development of Europe*, by J. W. Draper, M.D., LL.D., vol. i, p. 383. London, 1864.

factor in the development of the active principles of plants. Such early Hindu writers as Agnivesa, disciple of Atreya, Susruta, and Charaka, in the Vedic age, and Vagbhata, in the second century before Christ, have left long lists of herbs, which have since been added to, and even at the present day, on the heights of the Himalayas and elsewhere, at altitudes such as cannot be found in Europe, plants are still being discovered which possess peculiar medicinal properties. For example, various drugs have been made from Himalayan moss, gathered above the perpetual snow-line, which in the Himalayas is reckoned at 16,200 feet, and some of this moss is used in oils for insanity and paralysis.

The mineral kingdom furnishes a rich addition to the Hindu *Materia Medica*. Mercury is one of its most notable contributions, and seems to have been employed as an internal remedy from a very early date. It was regarded as the elixir of life. Iron, silver, and gold were accredited with tonic properties, and the modes of preparing them are described in detail by Susruta. The science of chemistry appears, indeed, to have been considerably developed.¹ It is to be remarked that gems, such as the diamond, emerald, turquoise, topaz, and many others, form part of this division of the Hindu *Materia Medica*.

There are some Hindu drugs which have been tried with excellent results for centuries in India. The therapeutic value of some of them might be carefully inquired into by scientific men of the West. For instance, there is one the Sanskrit name for which is *Silajatu*. I believe it is a sort of mineral drawn forth in a liquid state by the rays of the sun from the glacier region of the Himalayas, and subsequently solidifying. The Hindu physicians divide *Silajatu* into four classes, according to the particular mineral which preponderates in its composition either when liquid or solidified, viz. (1) gold *Silajatu*, (2) silver *Silajatu*, (3) copper *Silajatu*, and (4) iron *Silajatu*. The Hindu physicians (*Kavirajs*) make different preparations of the iron *Silajatu*, and use them for diabetes, consumption, and insanity. I have made over to Dr. J. D. Comrie, of Edinburgh, a small tin of *Silajatu* in the natural state and a little of it 'purified' according to the Hindu system, to enable him to have it chemically examined.

This paper deals with the purely Hindu system of medicine, and has nothing to do with the Yunani (Moslem) or Hakimi system prevalent in India. The Hindu drug *Silajatu* should not be confounded with the Yunani drug *Silajit* found in every Indian bazaar, and which is known generally as aluminous earth and Nepal earth. Careless writers have mixed up these two, owing perhaps to the similarity of the names.

Toxicology has long formed a subject of special study with the Hindus, and snake-bite in particular has been inquired into, Hindu physicians having been noted for their skill in this department in the time of Alexander the Great. 'Ailianos (H. A., xii. 32) says that,

¹ See *History of Hindu Chemistry*, by Dr. P. C. Ray.

while the Indians knew the proper antidote against the bites of each kind of serpent, none of the Greek physicians had discovered any such antidote.' ¹ 'Their (the serpents') bite was wont to prove instantly fatal, until a proper antidote was pointed out by the natives.' ² Nearchos, another Greek, also bears testimony to the skill of Hindu physicians in this branch of medicine. ³

Surgery was practised in Hindu India in very ancient times, though cases in which the modern Western surgeon applies the knife are now usually treated by drugs used internally and externally. The Hindus believe, as a rule, in following Nature to effect a cure, not in violent attempts to get rid of the symptoms of disease. The modern Kavirajs, or Hindu practitioners, are purely physicians, and have nothing whatever to do with surgery. But we have it on the authority of Sir William Hunter that in ancient times the Hindu medical practitioners performed rare surgical operations. The ancient University at Nalanda, near Gaya, was the seat of Hindu surgery. Even the earliest Hindu medical works describe numbers of surgical instruments and their use. Among the surgical feats familiar to the Hindus may be mentioned rhinoplasty, or the formation of new noses, skin-grafting, the removal of cataract, trepanning, bone-setting, and lithotomy. They were also skilled in amputations, and in treating rupture, piles, and abscesses, while vaccination seems to have been known to them from early times.

When we consider the great wars which were waged in ancient India, and the fact that the Mahabharata makes frequent mention of surgeons as a regular accompaniment of the army in the field as early as 1500 B.C., it is scarcely surprising that, with experience dating from such remote epochs, the Hindus achieved remarkable skill in surgery. Susruta, one of the earliest surgical authorities, gives elaborate instructions as to the performing of operations, and other old writers describe 125 surgical implements. Three methods of procedure were prescribed in surgery: treatment by instruments, by caustic, and by actual cautery.

The employment of anæsthetics by the Hindus in certain cases is recorded at a very remote age. Thus mention is made in the great Sanskrit work, the Ramayana, of a restorative drug, Sanjivani, which was used to bring back the patient to consciousness after a wound inflicted on the battle-field. It was also employed after a trephining operation in which an anæsthetic had been administered.

The use of hypnotism has long been practised in India. This is, after all, one of the most natural instances of Hindu anticipation of Occidental science, because my countrymen have always devoted themselves to the psychic as well as to the physical side of life. In the Mahabharata

¹ *The Invasion of India by Alexander the Great*, by J. W. M'Crindle, p. 217, note 2. 1893.

² *Ibid.*, p. 217.

³ *Ibid.*, p. 361, note Z, Indian serpents.

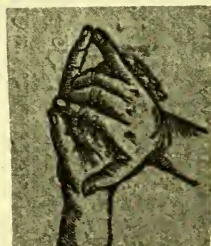
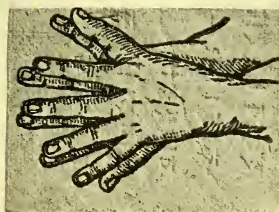
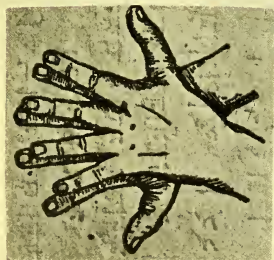
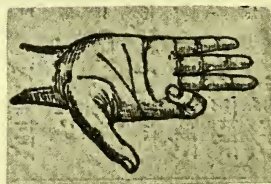
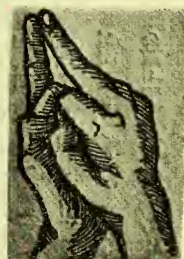
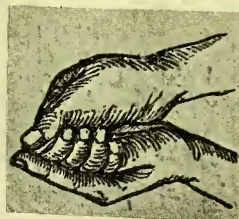
it is written : 'Hear me attentively ! There are two classes of diseases, bodily and mental. Each arises from the other. Neither is perceived to exist without the other. Of a truth mental disorders arise from physical ones, and likewise physical disorders arise from mental ones.'¹ The Hindu sages of those early days, holding, as they did, the theory that the soul is the cause and the body the effect, were not likely to let their physicians neglect the psychic side of man. Psychotherapy had been carefully considered in India centuries before the Christian era. They



turned their special attention to the nervous system, and built up a regular method for its control by will-power. More than thirty centuries ago the Hindu, under the names *Ida*, *Pingala*, and *Susumna*, studied the nervous forces.

The Hindu physicians seem to have turned their study of the nervous system to good account. I am giving here twenty-one photographic illustrations according to a Hindu system, showing how to arrange and twist the fingers in various ways for the prevention and cure of mental derangement.

¹ *Santi Parva*, xvi. 7-9.



The question of prenatal influence is another subject which has long attracted the attention of the Hindus. 'Before her child's birth', says the Hindu physician, 'the mother should be allowed as far as possible anything she desires, lest as a result of not gratifying her wishes the babe be malformed or deficient in any faculty. It is very important that she should be surrounded by pleasant sights, smells, and sounds; that she should eat fresh, clean, sweet, appetizing food in moderate quantities; that she should pass her time quietly and happily, shunning excitement of any kind; that she should not come into contact with a deformed, ill-favoured, or dirty woman, nor inhabit a lonely dwelling, nor sleep on a very high bed.' According to Susruta, there are seven causes of all the diseases of mankind, and one of the seven is the partaking of unsuitable diet by the prospective mother, or the refusal to grant any of her wishes during pregnancy. The same ideas still prevail in many parts of modern India, and, moreover, the culture of the babe's mind is actually begun while it is still in the womb. At a certain time before the child is born a day is set apart for a reception, at which the prospective Hindu mother has her woman friends and their children around her, and at which everything is done to awaken in her impressions of hope and joy, that these may be the predominant qualities in her babe's disposition. In Bengal this ceremony is called *Sadh*. So from both the material and spiritual side this subject receives in India close attention.

It should be noted that the Hindus have devoted considerable care to questions of diet and hygiene. They have studied the different climates—and no country can afford more varied climatic conditions than India—with regard to their effect on various diseases, and they have gone deep into hydropathy, examining the waters of their rivers, lakes, wells, and springs, and analysing their properties. Some of the directions in Hindu medical books for performing the toilet show that long ago they clearly grasped some of the modern principles of hygiene. The rinsing of the mouth with either warm or cold water as a remedy for specific ailments, the use of oils as unguents to be rubbed into the body, the dropping of oil into the ears, the rubbing of oil into the soles of the feet to give vigour to the legs, to cause sleep, and to improve the eyesight, the taking of hot or cold water baths, and of regular physical exercise, are emphasized by Hindu physicians. It may be noted that they say too hot a bath is harmful for the eyes, nor do they advise bathing for those whose eyesight is impaired. Some also urge that for washing hot water should be added to cold, not cold to hot. Anointing of the whole body before bathing is recommended for its invigorating effect. The liberal use of various unguents and perfumes is much dwelt upon, different applications being prescribed according as the weather is hot, cold, or rainy.

Diet has been fully considered. Two meals a day, one at morning and the other at evening, are to be taken, and 'govern thy appetite' has always been one of the Hindu's cardinal maxims. 'He that is devoid of

wisdom', says Yudhishtira in the Mahabharata, 'desireth much food.'¹ Hindu physicians say that half the space in the stomach should be filled with food, a quarter with water, and the rest left empty. One should never eat and drink to repletion. They recommend also that if one be hungry, one should eat before drinking, and vice versa if thirsty, dropsy and tumour being the possible respective results of the violation of these rules. Cleansing the teeth is particularly strongly advocated. After meals the mouth should be carefully washed, and the wet hands passed over the eyes with the object of improving the sight. To walk a little way after meals aids digestion, and then, after the walk, Hindu doctors recommend resting for a while on the left side. Massage is another very favourite remedy of the Hindus both in bodily and mental ailments, and seems to have been generally employed from earliest ages. Hindu physicians also advise the drinking of a certain quantity of water daily at sunrise as an aid to health and longevity.

The Kavirajs believe in regular sleep and early rising. For centuries they have studied the effect of sleep on the nervous system, and according to them *abhukta nidra*, or sleep on an empty stomach, by which is meant in Hindu parlance sleep between the morning bath and breakfast, is most conducive to tranquillity of mind. There are various peculiar modes of breathing taught by Hindu physicians to induce sleep without the use of narcotics.

If anything contained in this paper succeeds in attracting the attention of the learned medical men forming this Congress, I shall consider myself amply rewarded for the time and attention I have given to the subject for over a quarter of a century, and I heartily thank the Congress for allowing me, though not a medical man, to discuss Hindu medicine.

¹ Santi Parva, xvii. 6.



[Monday Afternoon, August 11]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

THE DATE OF LACUMARCINO'S 'DE MORBO GALLICO'

By EDWARD C. STREETER

By the labours of Proksch and others, the earlier tracts on Morbus Gallicus have been re-arranged, for the most part, in a strict and accurate chronological series. Still a few pieces defy all efforts at dogmatic dating, among them two very important works, the tracts of Peter Pinctor and of Jacobo da Lacumarcino. For Lacumarcino we possess material, overlooked till the present, with which we will strive to assign his place in the series. For the first time we may date with some certainty his tract 'De morbo gallico' and throw its contents open for ampler comparisons with treatises of the same subject and of the same time.

First, what have we accepted as the outstanding dates of Lacumarcino, or Cattaneus as he was later called? Hirsch's lexicon, on the authority of Pescetto (*Biographia Medica Ligure*), has merely this to say: 'Lacumarcino was a member of the collegium medicum of Genoa in 1484, published his tract "De morbo gallico" in 1505; was a contemporary of John de Vigo, and died in 1521.'

The date 1505, so often repeated as the date of this tract, was given a certain currency by Astruc. This date and the other dates given by the earlier Ligurian writers are so wide of the mark that their correction must entail multiple reversals of judgement of the historians of syphilis, particularly in connexion with claims of priority made for Lacumarcino in procedures in therapy.

For instance, Astruc grounds himself on the misconception that John de Vigo borrowed hugely from our author in his famous Chapter V on Morbus gallicus in the *Chirurgia Copiosa*. Astruc states that the eminent surgeon of Julius II stole outright from his more obscure fellow citizen, without acknowledgements. Had Lacumarcino written his monograph in 1505, as Astruc supposed, nothing more natural than that Da Vigo, writing in 1513, should incorporate as much as he chose of this unpublished material issuing in manuscript out of his native Genoa. But Da Vigo's work antedates the first manuscript copy of Lacumarcino by just ten years. Hence no credit is due to Lacumarcino for the immensely

popular *Copiosa* of Da Vigo—a work which exhausted twenty-six editions previous to the year 1678 (pretty near the record for a handy text-book of surgery). Astruc should have seen that Lacumarcino could not possibly have served as a source for Da Vigo, for he apparently handled our key to the date of Lacumarcino's tract, the dedicatory epistle to Andrea Doria. Astruc knew that the work was dedicated to Andrea Doria. Now in 1505 works were not yet being dedicated to this wonderful man—he was, in fact, just beginning to dedicate himself to works. He was an obscure adventurer until 1513.

I think we may safely challenge any one to produce any literary product of this section of Italy bearing a dedication to Doria previous to 1520. If the tract was dedicated to Doria, then it must have been dedicated posterior to 1520, it would appear.

But aside from this vague argument, Astruc must have seen in the opening lines of this epistle, if he had an opportunity to read it, as we suppose, in the edition of Turin printed in 1532 (the only edition which contains the dedication mentioned by him)—he must have seen, I say, this address and these titles which tell the story: 'To the illustrious Lord Andrea Doria, Knight of the sacred order of St. Michael, Admiral of the King's Fleet.' By 'king' of course Francis is meant. Doria was made admiral of the French fleet in 1522, and his 'condotta' extended for six years. He was given the order of St. Michael at about the same time. 1522 is the earliest possible date, then, of this treatise, and 1532 is the latest possible date, for it appeared in printed form in Turin in that year. This edition has escaped the notice of all who have done research in this field. It is of the utmost rarity, so even Proksch may be pardoned for having overlooked it.

A still closer approximation of the date of Lacumarcino's work is possible. I have here a manuscript of the work, which is dated by the copyist 1524. This narrows the dates down to 1522-4. I think we may advance a hesitating step further. From the very neat Italic characters and general elegance of execution, from the choice quality of the vellum, and other paleographic details, we may conclude that this copy was prepared for presentation by the author to the great admiral. The copy was executed by Lazarus a Parentibus, a patrician of Genoa. It has been robbed of its rich binding and clapped into old boards. It consists of 93 leaves quarto, 18 lines to a full page. It bears the earmarks of being the first fair copy of this exhaustive treatise.

Our ignorance of the date of this tract chanced from the merest oversight. Neither the Turin edition nor a manuscript of the work were known to exist. Luisinus, in preparing Lacumarcino for inclusion among the scriptores 'De morbo gallico' printed in Venice in 1566, had shorn the work of the 'epistle dedicatory'. No trace of its date was left when it came to its later reprinting.

On comparing this manuscript with the copy of the 1532 Turin edition in the library of the Surgeon-General's Office in Washington (a

brochure 19½ by 14¼, of 28 folios numbered, with a Renaissance wood-cut border on title) only one variation is noted, but this is a highly significant one. It is a change in the author's own name. In the MS. he is Jacobus de Lacumarcino. On the title of the 1532 imprint he is now called Jacobus Cattaneus de Lacumarcino. The Cattaneus in his altered name, by which he was thenceforth known, accrued to him as late as 1528, when he joined the Albergo Cattanei, the noblest clan in the Genoese territory. Thus it was at the time of the plague of 1528, when Doria was parcelling out the reduced cities' populace among the Albergo of the nobles, that Lacumarcino got the name, the clan-name, Cattaneus. This name can only be attached to our man on the supposition that he was still living in 1528. All historians agree in placing his date of death at 1521, except J. K. Proksch, who shrewdly concludes, from internal evidence alone, that he could hardly have begun his great work at that time. We have proven that he wrote about 1524 and took on a new name in 1528.

I strongly suspect that Piaggio (the source of our knowledge on this point) omitted a Roman numeral X in transcribing for his *Monumenta Genuensis* the date line on Lacumarcino's epitaph at St. Maria di Castello. 1521 should read 1531. The Turin imprint of 1532 was a very limited memorial issue, we may venture to say, coming at the time that it did, and coming from Turin and the press of Bernardin Silva, who was not a printer of medical matter.

If 1531 is the likelier date of the closing of this man's career, his birth probably fell in the years 1455-60. He was born at Lagomarsino in the Genoese contado. His medical education, where acquired? His liberal saturation in the classics bespeaks the broader opportunities for medical culture of Bologna, Padua, or Ferrara. Bologna received the larger proportion of Genoese youth. At any rate, he was seated in the home collegium medicum in 1484 and attended the sessions of the medical guild in the cloister of St. Maria delle Vigneis. He appears in 1495 as a 'super-numerarius' and a signer of a petition framed by the college addressed to the Doge Agostino Adorno pleading reform of statutes. We know much of his fellow signers but little of Lacumarcino, save that he moved among these men. Giovanni de Bernardis, the Saluzzon surgeon, according to Da Vigo the leading operator of his day in Genoa; the brilliant Ambrogia Oderico, soon to be with Da Vigo at the papal court; the feeble ex-rector Paolo Gentile, 'spettabile' in rank; Prospero Calani, later to become a Count Palatine; Rosso, of rare goodness and learning, later raised to the Dogeship; and that ripe Hellenist Laurentius Majolus called away by Aldus to edit Aristotle, who taught surgery at Ferrara, and, with equal acclaim, philosophy at Padua and Pavia: these were his *confrères*. His particular patron, aside from his connexion with the two branches of the Doria family and with the house of Fillipo Sauli, was the merchant Antonio Gallo. Lacumarcino is frequently mentioned in the diary of this man, who was chancellor of the Bank of St. George and the earliest biographer of Columbus. From the diary we learn that Gallo

showered gifts with a large hand upon the physician 'qui medetur sine pretio'. Particularly at Christmas Gallo was wont to send Lacumarcino 40 lb. of wax wrought into the shape of a great cock of Esculapius or a Neapolitan cheese. We learn in the diary that Isabelletta and Battista, Gallo's children, were kept at the breast 25 and 21 months respectively. From 1505 to 1509 Lacumarcino had four deaths in his patron's family, ending in the loss of Gallo himself. Later both Lazzaro and Andrea Doria favoured him, it is known. The great Bishop Sauli, protector of letters, probably loaned him what he needed of Greek and Latin medical codices, of which the bishop had 300 on medicine alone.

But our aim was not to attempt the portrait of the man who wrote the best treatise on syphilis of his time, but to determine the date of that piece of work, and incidentally the date of the author's death. As a result, instead of 1505-21, we now propose 1524-31.

[Monday Afternoon, August 11]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

NOTE ON THOMAS DE WESEHAM, THE KING'S
SURGEON, WITH SPECIAL REFERENCE TO
THE KING'S MONEYPERS, 13th CENTURY

BY MR. LAURIE LAWRENCE

GENTLEMEN,—During an investigation I was making into the history of the coinage of King Henry III of England, issued between 1248 and 1272, I had occasion to consult calendars of various sets of rolls now in the Public Record Office in this city. These calendars are printed books giving more or less briefly the gist of the various entries in the rolls themselves. The entries contain information of the most varied kinds, but the events detailed all describe a connexion of some sort with what we now call the State. A man may have been a debtor or a creditor to the State or to the king. He may have been a tenant *in capite* of the king, or have received a pardon from him, or have provided a coat or sixpennyworth of herrings for the king's use. These and thousands of like entries are to be found in these indices of the rolls. They are in nowise histories as are the chronicles of ancient writers, such as Bede, The Anglo-Saxon Chronicle, and the writings of William of Malmesbury and many others. An examination, therefore, of the various rolls only gives us official information concerning individuals, seldom anything by which we can trace their personal history. This latter must always be conjectural unless the individual was of sufficient importance to find a place in the writings of the historians of the period.

Now although we cannot glean much of a private nature from the rolls there is information of interest to us as doctors to-day as to the status held by our predecessors, the doctors of the thirteenth century.

Most men's names are entered on the rolls simply as John son of or John de, or with a name or surname; a doctor is generally described as magister or master, and medicus or le leche or chirurgicus often follows the name. There are names of many medical men given, but as a rule the entries concerning them are of the briefest, and generally the information is limited to one or two entries. Such is happily not the case concerning the king's doctor, about whom the rolls tell a small story, and

there is something also to be learned about another medical man, who was in charge of the queen's health.

A few explanatory words must now be said about the coins which caused this search to be made in the rolls. The coinage at this time consisted solely of silver pennies. They bore on one side the effigy of a king surrounded by his name and title as a legend; on the other side an ornamental cross, each limb reaching the edge of the coin.

The legend was the name of the mint where the coin was struck (there were nineteen mints in England then), and the name of the minter or moneyer, who was in those times responsible for the correct weight and purity of the coin. His fee was a seignorage on the coins struck and his penalties for false coinage ranged from fine to mutilation.

Whatever may have been the custom in earlier times in relation to the actual striking of money by the men whose names were registered on the coins, certainly in Henry the Third's time this was not the case, as many of the names are now known to designate men in far too high a position in life to justify actual manual work as artificers. An entry from the calendar of the Patent Roll shows this.

1243, July 8, Bordeaux. 'To the Archbishop of York and the Bishop of Carlisle. The King has written to them several times for Robert de Cantuaria, the younger, for them to provide for him in an Ecclesiastical benefice of the value of 60 marks a year in the diocese of Canterbury and is astonished that they have not done so.' Again:

1257. 'Grant for life to Robert de Cantuaria son of Robert de Cantuaria some time King's clerk, of one of the King's dies in the mint of Canterbury.'

Evidently the benefice had been found, as Robert de Cantuaria the younger is spoken of in the second entry as 'some time King's clerk'.

Entries of this sort could be multiplied, but these are enough to show that the moneyer was not a mere workman.

The entry which was the cause of these notes is as follows:

1260, May 27, Westminster. 'Grant for life to Master Thomas de Weseham, the King's surgeon, of that die in London which David of Enefeld formerly held, for 100 shillings a year to be rendered at the exchequer at the same terms as other keepers of the King's dies pay their farm. Mandate to the Keepers of the dies of London to give him seisin thereof.'

This entry is interesting enough in itself, but additional interest is lent to it by the discovery of the actual coins struck by Thomas de Weseham. There were three of these pieces found in Brussels a few years ago amongst a hoard of close on 100,000 pennies of Henry III.

These three are all struck from the same reverse die, and read THOMAS ON LUND, which means that they were struck by Thomas in London. These coins by Thomas were of the greatest help in the classification of the coins of Henry III, as David of Enfield's pieces, which were well known previously, vary slightly in type from those of Thomas. These London coins bearing the name of Thomas were unknown before the

unearthing of the Brussels hoard. Perhaps enough has now been said about the coins, and we may proceed to other entries referring to Thomas de Weseham.

The earliest entry I can find concerning him runs as follows :

1253, May 30, Sutton. 'Protection for the following going with the King to Gascony for so long as they are in his service in those parts with the King.'

A long list of names follows which includes that of 'Master Thomas the surgeon (cyrugicus)'.

The king went to Gascony to settle troubles which involved his sovereignty and possibly a war with Spain, which was, however, amicably settled by marriage proposals for Prince Edward. The king was abroad for over a year, as will be seen further on by an entry in 1254, when the queen joins the king in Gascony.

Two years later the Charter Roll gives us another entry about Master Thomas.

1255, June 16, Woodstock. 'Gift to Master Thomas de Wheseham the King's surgeon of a messuage in Colchester late of Isaac the Jew, of Colchester which by judgement of the exchequer of the Jews, the King recovered against Peter Peper and Nicholea his wife as the King's escheat by the death of the said Jew, as reported by John de Wyvyle and Simon Passelewe justices for the custody of the Jews, to be held by the said Thomas and his heirs by the service due therefrom to the King and the chief lords of the fee.'

A further grant was made in the next year, for the Patent Roll tells us in

1256, May 30, Sutton. 'Grant for life to Master Thomas de Weseham the King's surgeon of the bailiwick which Hugh de Loges held in the forest of Kannoke.'

Things evidently went well with Master Thomas, and he seems by the next entry concerning him to be settled in the capital. The Charter Roll for 1259 tells us the following :

1259, Oct. 24, Westminster. 'Gift to Master Thomas de Weseham the King's surgeon of a plot of land eighty feet long and thirty-five feet wide in Colemanstret in the parish of St. Stephen's London late of Salomon le Eveske, a Jew, which is the King's escheat by the felony of the said Salomon, and lies between the land of Peter son of Alen to the north and the land which the said Thomas previously had of the King's gift to the south ; to be held by the said Thomas, his heirs and assigns, of the King by performing the service due therefrom.'

I have been unable to find an entry concerning the first gift of land in Coleman Street to Master Thomas, but shortly after this second gift the king seems to have forgiven the former owners of the land and retransferred it, or what remained of it, in his gift.

1260, Aug. 9, Windsor. 'Gift for a fine made with the King to Cresse and Hagin sons of Master Moses a Jew of London of all the lands and houses late of Salomon le Evesque in the city of London which

escheated to the King for divers trespasses forgeries and crimes whereof the said Salomon was convicted before Hugh le Bigod the justitiar and the Justices of the Jews and for which he abjured the realm, saving the land in the parish of St. Stephen, Colemanstret lately given to Master Thomas de Weseham the King's surgeon ; to be held by the said Cresse and Hagin, their heirs and assigns by the service due therefrom to the chief lords of the fee, Et pro ista carta dant ccc marcas et habent cartam illam quietam de sigillo.'

In the same year the king granted to Master Thomas the custody of the money die before quoted.

The next year, 1261, another gift of land in Colchester was made to Thomas de Weseham, the terms being the same as those already mentioned, but the land had previously belonged to ' John son of Elias de Colecestre '.¹

The Patent Roll, for 1264, gives us an interesting entry,

1264, Sept. 8, Canterbury. ' Grant to Master Thomas de Weseham, King's surgeon in consideration of his services and for a certain cross which he gave to the King, of £15 yearly of Lands of escheats as they fall in ; to hold to him and his heirs for ever.'

1265, June 11, Hereford. ' Simple protection for Thomas de Weseham ' and others.

1265, Sept. 12, Winchester. ' Grant to Master Thomas de Weseham the King's surgeon and his heirs of the bailiwick which Hugh de Loges held in the forest of Kannoc with all things pertaining to the same, which bailiwick the King had granted to the said Thomas for life.'

Master Thomas now appears in another character.

1266, Dec. 26, Oxford. A pardon is granted to ' Henry son of Alfred de Papewyk on the mainprise of Master Thomas de Weseham of the County of Stafford and Robert Blundell of the County of Lancaster, that he be of good behaviour ', &c.

1267, June 30, St. Paul's, London. ' Confirmation at the instance of Master Thomas de Weseham the King's surgeon of a grant which Samuel son of Isaac the Jew of Norwich made to Simon le Paumer of a messuage in Norwich in Conesford Street.'

In the same year we get another entry in the Patent Roll.

1267, Sept. 15, Shrewsbury. ' Notification that the Archdeacons of Suthbiry and Norfolk delivered in the Wardrobe to the aforesaid Nicholas de Leukenor on Thursday the morrow of the Exaltation of the Holy Cross 51 Henry III by the hand of Thomas de Weseham 80*l* in part payment of 200 marks by which they made fine with the King for paying the tenth of that year according to the ancient taxation in the bishopric of Norwich.'

Nicholas was the keeper of the wardrobe, which would appear to have been something more than an office for the care of the king's wearing apparel, as receipts and payments here in connexion with

¹ 1262, Oct. 23, Meaux. ' Protection with clause for Master Thomas de Weseham the King's surgeon now with the King in France for such time as he is with the king.'

ecclesiastical affairs are frequently referred to. A mark was a money of account only, not a coin; its value was 13s. 4*d*.

1269, Nov. 6, Westminster. 'Pardon at the instance of Thomas de Weseham to Geoffrey le Mouner of Thurkeleston for the death of William de Daleby as it appears by inquisition made by Gilbert de Preston that he killed him in self-defence.'

1271, June 8, Westminster. 'Licence for Thomas de Weseham to buy according to the form of the late provision all the debts wherein William de Burlee is bound to Jacob, Jew of Oxford, and any other Jews.

There is a further entry under the year 1271 which is out of its place in the calendar.

1271, March 6, Westminster. 'It has been shown to the King by Thomas de Weseham that whereas Nicholas son of Master Henry le Cyrugien of London by deed enfeoffed the said Thomas of a moiety of a messuage in London and put him in seisin thereof, in which he was in peaceful possession for seven years and more and the said Nicholas afterwards impleaded him thereof before the mayor and bailiffs of London, by writ of right, and the said Thomas produced before them his deed of feoffment, and the said Nicholas acknowledged it, but asserted that he was under age at the time of making it, and the parties put themselves upon an inquisition as well of the witnesses named in the deed as of lawful men of the three adjoining wards of the city; and the mayor and bailiffs detaining the said deed, made the inquisition not by the said persons, but by persons from a distance and strangers, and adjudged seisin of the said moiety to the said Nicholas, contrary to law and the custom of the City. The King has therefore appointed Ralph de Hengham and those whom he associates with himself to call before them and the process of the said plea and correct any error therein at St. Martin's le Grand London.'

Under the heading 'Confirmation of Grants to Jacob of Oxford (Jacobo Oxonie) Son of Master Mosseus a Jew', we get

1271, Nov. 12, Westminster. 'by Thomas de Westham of land and houses in the parishes of St. Stephen Colmanstret and St. Margaret Letheberi London;'

Evidently this is the same Jacob mentioned to whom William de Burlee was bound, and, as we should now say, the bills of whom were bought up by Thomas de Weseham. One wonders who got the better of the bargain.

In the next year the Patent Roll tells us something of Thomas de Weseham's Stafford estate.

1272, Jan. 2, Winchester. 'Pardon to Thomas de Weseham, steward of the forest of Kannok, of all trespasses, forfeitures, and excesses done by him and his men in the said forest from the first day of the King's grant to him of the stewardship to Friday the Circumcision 56 Henry III.'

1273, Feb. 16, Westminster. 'Protection with clause volumus until whitsuntide for Thomas de Weseham.'

This seems to be the latest entry actually concerning Thomas de Weseham, but there are one or two subsequent entries in which his name occurs which are worth quoting, as they add something to his history.

1281, Oct. 26, Westminster. 'Licence for Isaac de Suthwerk and Zipporah (Cippore) his wife to sell to William de Thelnetham, Citizen of London, a messuage in the City of London situated in the parish of St. Michael in Bassieshawe between the house of Michael Oyntel and that of Thomas de Weseham and Sarah his wife.'

From this entry we obtain the name of Thomas's wife.

Lastly in

1284, July 20, Carnarvon. 'Confirmation of a charter whereby Thomas de Weseham with the King's licence transferred to Philip de Montgomery the grant made to him by Henry III of the whole bailiwick which Hugh de Loges held in the forest of Kanoc, with the stewardship and everything pertaining thereto. writ of de intendendo directed to the foresters etc. with mandate to read the said charter in full swainmote of the forest.'

One more mention of Thomas de Weseham is to be found in an imperfect and undated entry on the inquisition roll.

Hugh de Loges.

No. 643. Writ of Certiorari 17 Aug. 51 Hen. III.

(Warwick) Cesterton manor was held by the said Hugh de Loges of the King by Serjeanty together with the bailiwick of the forest of Kanoc and other lands in Co. Stafford by doing to the King yearly 10 marks from the said bailiwick which Master Thomas de Weseham and the bishop of Chester now receive from the foresters. He never did any other service to the King for the manor nor was anything ever levied . . . from the manor. C Hen. II, File 33 (17).

These late entries do not make it clear whether Thomas de Weseham was then alive or not. The sale of the house next his in 1281 mentions him and his wife by name only. The confirmation of the charter with date 1284 only lets us know that by that time Cannock, with its wealth of coal-mines, then, of course, unknown, had passed out of Thomas de Weseham's ownership. The coins again are hopeless in aiding us. The three known are all exactly the same, and these resemble very closely a large number of others bearing the names of different moneyers.

They are all of a type attributable to the decade 1260 to 1270. It is unfortunate that, having secured so many entries relating to Thomas de Weseham, we cannot find anything bearing on his professional or private life. An examination of the entries may perhaps allow of some surmise. The date of the first entry is 1253; Thomas is here described simply as the surgeon. Protection is granted to Master Thomas cyrugicus. From that time until 1267 his description is Master Thomas de Weseham the king's surgeon; subsequently it is Thomas de Weseham only. This looks as if the surgeon had retired from his court duties, and the suggestion is further borne out by the two documents in which his London and Stafford properties are disposed of to others. The twenty years of entries

actually concerning him may be taken as some kind of gauge of his age. A surgeon then, as now, was probably ripe in years and experience before receiving a court appointment, and the many years' exercise of this appointment would account for the change in title. He was probably an old man by then. It may be asked why he should be appointed to a money die. The likely answer is simple. The moneyers received a large seignorage on the money coined from their dies, and I think we are to look on the possession of a die in the light of an investment bearing great profit.

In searching the calendars for the entries already given I was fortunate enough to obtain information concerning other members of our profession. Amongst these I noted four entries referring to another king's surgeon living at the same time as Master Thomas de Weseham. The entries are all from the Patent Rolls 1251 to 1254.

Master Henry de Saxeby

1251, Feb. 20, Kempton. 'Grant to Master Henry de Saxeby King's surgeon for a fee of 10*l*. a year at the exchequer until the King provides for him in land to that yearly value out of escheats, to hold to him and his heirs. By K.'

1253. 'Grant to the King's Sergeant Master Henry the King's surgeon, King's clerk, of 10*l*. a year at the exchequer until the King provide for him in an equivalent of land to hold to him and his heirs; with mandate to the abbot of Pensore the escheator, as soon as any escheat to that value fall in to assign the same to him.'

1254, May 8, Westminster. 'Protection with clause volumus (except where otherwise specified) for the following who are going with the Queen to the King in Gascony for as long as they are in the King's service.'

'Master Henry the surgeon (cyrugicus)' is mentioned in a long list of other names.

1254, Oct. 4, Bordeaux. 'Grant to Master Henry the surgeon in compensation of his yearly fee of 10*l* at the exchequer of what ever can pertain to the King in the City of London of the lands late of Peter de Frowicke who abandoned the Christian faith, as it is said, to hold to him and his heirs for ever, doing the customary due service to the chief lords; so that what ever is received therefrom be deducted from the said yearly fee.'

Unfortunately these are the only entries I could find concerning Henry de Saxeby. It is interesting to note that he was Sergeant surgeon to the king, an appointment existing to the present day. The latest of these entries would also show that, according to his description, he ceased to hold the king's appointment before May 8, 1254; he was therefore probably succeeded by Thomas de Weseham, for in June 1255 the latter is described as king's surgeon. This Henry de Saxeby is probably the father of Nicholas the junior with whom the dispute arose with Thomas de Weseham already referred to. I regret that time will not allow a reference to other court doctors of whom there are records.

Perhaps at some future time I may be allowed the honour of bringing these to your notice.

[Tuesday Morning, August 12]

SECTION XXIII

HISTORY OF MEDICINE

THE RELATION OF BOTANY TO MEDICINE

By SIR FRANCIS DARWIN, CAMBRIDGE

THE title of my paper will recall to many of us the most dreary part of a medical training. To-day, no doubt, things are better managed, but in my time our pharmacological education consisted in learning by heart a certain book on *Materia Medica*, from which, among other useless detail, we learned the names and natural orders of the medicinal plants. Of this so-called education Huxley has said that it is about as rational as it would be to force the surgeon to know the processes—mining, smelting, forging, &c.—by which his operating knives are made from the raw material.

The blind and purposeless study of *Materia Medica* from the botanical side is in fact a fossil, a petrification of what, in mediæval times, was a living part of medical work. When a doctor depended on his herb-garden he certainly ought to know the herbs. But even in the sixteenth century we find Fuchs¹ swearing by immortal God that not one physician in a hundred knew his plants.

Nevertheless, the herbals, from which our chief knowledge of mediæval botany is derived, were written from a medical rather than a botanical point of view: they treated of the 'vertues and proprieties of herbes', that is to say, of plants as sources of medicaments. The idea that plants are only worth study from the physician's point of view lasted to comparatively modern times, for we find Buffon holding it unnecessary to count the stamens in plants which have no medicinal value.² But this narrow point of view was not universal. No one can look at the beautiful drawings in the herbals and doubt that the makers of these books loved plants for their own sake. Indeed, it may be argued that Botany profited as much as Medicine from the interaction between the two sciences.

The need for division of labour has long since handed over the knowledge of medicinal plants to specialists at the great botanical centres of the world. Any one who will look through the *Kew Bulletin* will find evidence enough of the minute and continuous inquiry that is carried on as to the source of drugs. In the same way the preparation of drugs is in the hands of the great firms whose names we all know and respect.

¹ Mrs. Arber's book on *Herbals*, 1912, p. 60.

² Miall, *The Early Naturalists*, p. 372.

In fact, the old-fashioned conception of the Physician as Botanist, or *vice versa*, is dead.

My object to-day is to give the history of quite a very different relation between the two sciences, if indeed that can be called history which refers to what is still in active progress. My point is the value of the light thrown by botanists on certain fundamental physiological problems. These problems may be grouped together as dealing with the boundary which spatially separates living from non-living material. I mean the limiting membrane of protoplasm. This limiting surface or membrane separates, in fact, the drugs of the physician from the patient, since only what passes the ectoplasm or limiting membrane of the living protoplast can affect the organism.

This, of course, is an osmotic question, and botanists are justly proud of the contribution to this subject which the world owes to their science. The celebrated botanist Nägeli was the first to make clear in 1855 the general bearing of the diosmotic properties of the vegetable cell. Then in 1865 M. Traube, with his well-known experiments on precipitation membranes, showed the possibilities of the semi-permeable membrane. The whole subject was greatly advanced by Pfeffer in 1877, who placed Nägeli's and Traube's conclusions on a sounder physical basis in regard to semi-permeable membranes, and determined for the first time the osmotic pressure obtainable with different solutions. I remember Lord Kelvin speaking to me with a certain indignation as though we botanists had not realized how great a physicist we had in our ranks in the person of Pfeffer.

Then came De Vries (1877), who showed the perfection of the vegetable cell as an apparatus, and the remarkable manner in which mineral and organic solutions can, by the use of such cells, be arranged in groups which are then found to be characterized by similarity in their molecular constitution.

For instance, De Vries (1888) was able to decide between the rival formulæ proposed for the sugar Raffinose. The plant-cell's behaviour declared for a molecular weight of 596, which is a wonderfully close approximation to the formula $C_{18}H_{32}O_{16} + 5 H_2O$ corresponding to a molecular weight of 594.

All this is well known and need not be dwelt on, for no one is likely to deny the great value of botanical work in the investigation of the physico-chemical properties of the plasmic membrane behind which is hidden the secret of life.

They were also botanists (De Vries, Wieler, Klebs, &c.) who about 1888 made what I believe were the first observations of the permeability of the plasmic membrane to certain reagents, namely, glycerine and urea. I am speaking, of course, of the living membrane; the ectoplasm is easily permeable when dead. In the same direction Overton (I am glad to be able to quote an Englishman), working on vegetable cells, demonstrated in 1895 the passage through living ectoplasm of

a number of organic substances, alcohol, ether, chloral hydrate, sulphonal, caffeine, antipyrin, &c.

I cannot speak of Overton's important work in detail; I shall only point out that it led him to a theory as to the nature of the plasmic membrane which (so far as its main point is concerned) has been recently supported by a totally different line of experiment. I refer to Overton's theory that the limiting surface of protoplasm is of a fatty or lipid nature. Without asserting that this view is proved, I may at least take it as a type of the valuable suggestion which botanists have been able to make. It is a conclusion not to be neglected by the physician, since the fact that a large number of narcotics dissolve fat obviously suggests a theory of their power of entry into a cell guarded by a fatty membrane.

The confirmation of Overton's theory comes again from a botanist, namely, Czapek of Prague (1911), whose remarkable work, based on the relation between surface-tension and osmosis, seems to me to prove that the ectoplasm, i.e. that which decides what shall and what shall not pass the plasmic membrane of the living cell, is lipid in character, is in fact a fatty emulsion. Czapek investigated the phenomena of exosmosis in plant cells in relation to surface-tension. Broadly speaking, he found that exosmosis occurs, that is, the membrane becomes permeable, when the cell is treated by any organic solution of sufficient concentration to have a surface-tension of 0.68, i.e. a tension which is 68 per cent. of that of water. From this it follows, in a way I cannot stop to consider, that the surface-tension of the protoplasm itself has this same value, namely 0.68.¹ The importance of this is not evident at first sight. But when Czapek goes on to prove that the surface-tension of a saturated emulsion of neutral fat is also 0.68, we are compelled to see in this result a remarkable confirmation of Overton's theory of a fatty limiting membrane.

It is like the end of a play where two characters are happily and unexpectedly united at the end. And as on the stage the hero and heroine generally receive the blessings of an eminent character or aged relative, so the united physiological theories of Overton and Czapek receive the blessing of Physics, that father of the sciences. For Physics tells us, in the Gibbs-Thomson law, that substances in solution which lower surface-tension must accumulate at the surface of that solution. So that a lipid surface-layer, of which plant-physiologists assert the existence, is the very thing that a physicist would be forced to prophesy as a result of the laws of thermo-dynamics. I am aware that this is a very speculative point of view, but it is too attractive to be omitted.

One other word: when my father was working at insectivorous plants, he observed a peculiar intracellular precipitation in the tentacles of *Drosera*. This discovery was misunderstood at that time, 1875,

¹ This is disputed; but the surface-tension of protoplasm must at least have a definite relation to 0.68.

but it has now turned out to be of great use, for the precipitate supplies the most perfect material for the study of exosmosis in the living cell, and thus in a roundabout way contributes to our knowledge of the character of that all-important surface where living plasm meets the outer world.

Any one acquainted with the work of which I have spoken will see at once how small a part of an important subject is here dealt with. I am fully alive to this. My idea was merely to sketch, in rough outline, the character of the service which modern Botany has rendered to Medicine.

[Tuesday Afternoon, August 12]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

GALEN'S KNOWLEDGE OF MUSCULAR ANATOMY

By JOHN S. MILNE, M.D. ABERDEEN, HARTLEPOOL

FORTUNATELY there are extant works of Galen to show the entire range of his knowledge of muscles. These are the little compendium known as the *Anatomy of Muscles*, a synopsis containing all the muscles, classified under the headings of the joints they move, and an account of their origins and insertions. The action of each muscle is given.

This and all the other works existing in the original Greek were published by Kuehn, Leipzig, in 1827, with a Latin translation. Next there is the great work known as the *Manual of Dissection* in fifteen books. Book I contains the dissection of the muscles of the upper limb, Book II that of the lower limb, IV the head and neck, V the trunk. All these books are to be found in Kuehn's edition.

Book X contains among other things the dissection of the orbit and tongue, Book XI that of the larynx. These last two books are not extant in the original Greek, but an Arabic translation exists, and this, along with the other five 'lost books', has been published by Max Simon in his monumental work, *Galenus' Sieben Bücher Anatomie* (1906), consisting of the Arabic text, a translation in German, and voluminous commentaries on Galen's anatomical knowledge and annotations identifying the parts described.

In Galen's *Manual* a full description of the method of dissection, with the means for the identification of the muscles, is given, and in many cases the description given is rather fuller than in the *Anatomy of Muscles*.

Thirdly, there is the important book on the 'Utility of Parts'. Along with a description of the other parts of the body it contains an enumeration of the muscles and their attachments and an account of their functions, and a demonstration that every part has been created in the best possible fashion in view of its intended function. From this point of view he discusses every muscle of the body *seriatim*. Besides Kuehn's edition the great French scholar Daremberg published a translation in French of the whole of this work with annotations identifying the different parts described, including the muscles. This work is a most

valuable one for the student of Galen. In this work Daremberg makes frequent reference to a treatise on Galen's knowledge of anatomy and physiology which he had intended to publish as a volume supplementary to his translation.

Unfortunately for the historical student, Daremberg died before the completion of the series of volumes of classical medicine which he had projected, and so far as I am aware the thesis has not seen the light, though it is greatly to be hoped it is preserved somewhere in the Archives of France. There is another little book on the action of such muscles as those in the eyelids, whose functions are obscure and require special discussion. These are mostly muscles which, not being attached at either end to bone, cannot be tested in the ordinary way by making traction on them.

The translation of this little book was published by Daremberg in the same volume as the 'Utility of Parts'.

As he tells us himself, for various reasons—amongst others that his manuscript of the *Manual of Anatomy* was lost in the fire which destroyed his surgery in Rome—he at different times produced revised editions of his works, and thus it comes that cross references to each of the other works are to be found in any one, and this explains the discrepancies between the descriptions of the muscles as given in the different books.

MACACUS INUUS

Galen's anatomy is not the anatomy of man. The myology is mainly that of the *Macacus inuus* or Barbary ape. This species is dying out, and the difficulty of obtaining specimens for dissection and the difficulty of obtaining access to a modern myology of this animal I have found to be the greatest obstacles to the interpretation of Galen's works.

I have had the good fortune, however, to acquire several specimens and to consult a manuscript account of the 'Myology of the Catarrhini' by Professor Arthur Keith.

Besides the ape, Galen dissected all sorts of other animals, baboons, weasels, cattle, and that great stand-by of the mediæval dissector, the common pig. Even the elephant he dissected.

Frequent references to the shape and functions of the muscles of animals other than the ape are to be found in his works.

The dissection of the muscles of the orbit and those of the larynx is admittedly performed on such animals as the ox, but the myology of the tongue is that of the ape. Here and there, however, he indicates that he is aware of the difference between certain of the muscles he is describing and those of man; for example, in his description of the flexor longus hallucis and that of the latissimo-condyloideus.

FONDNESS FOR SYSTEM

Our classification of muscles owes much to Galen. The men of his day were feeling their way towards systematizing the mass of informa-

tion which had been accumulated by previous workers, and Galen had a happy faculty of arranging large masses of data and systematizing them so as to render obscure things lucid for beginners. Many of his lectures were to fashionable audiences not actually in practice as professional physicians.

ORIGIN V. INSERTION

His views as to the distinction between origin and insertion of muscle are those of the present-day anatomist.

DEFINITION OF A MUSCLE

As to whether a particular set of muscle fibres is to be regarded as a single muscle, simple, or bifid, or as two or more muscles, the points to be regarded as most important are the singleness between origin and insertion, along with unity of function, but as the deductions to be drawn from a study of these are often conflicting, a compromise must often be regarded as sufficient.

At times, not often it is true, he yields his own opinions to the recognized teaching of the older anatomists in order to avoid confusion.

ACTION OF MUSCLES

He placed great importance on the study of the action of muscles and made a special study of this.

First of all the muscle is inspected, and often the situation of the attachments will give a clue to the direction in which it will act.

The final test is to pull on the muscle and observe the effect of the traction. This must be done while the parts are yet fresh, and if the movement is complicated or the muscle small in comparison to the part to be moved, the other fleshy parts are to be cut away in order to lighten the task.

GALEN'S NOMENCLATURE OF MUSCLES

He has few special names for muscles. Among these are the masseters and the temporals and the cremasters.

Mostly he identifies them by their function, or their number in his classification, or their attachments. Occasionally by their colour.

Thus the *biceps of the arm* he calls: 'The largest muscle which goes to the elbow-joint.'

The *deltoid*, 'the muscle occupying the highest part of the shoulder'.

The *subscapularis*, 'the muscle spread over the concavity of the scapula'.

The *latissimus, dorsi*, 'the second muscle rising from the flanks and moving the shoulder-joint'.

The *serratus magnus*, 'the muscle situated on the concave part of the scapula and dilating the thorax'.

The *bulbo cavernosus* as 'the muscle at the neck of the bladder'.

The *adductor pollicis* as that muscle which adducts the thumb to the index.

In other cases he refers to a muscle by some description he has previously given of it. Thus, having remarked that he once saw a certain muscle (our *biceps cruris*) torn across in a runner without interfering with the man's ability to race after a short period, he refers to it afterwards as 'the muscle I spoke of as being torn in the runner'.

The *pyriformis* he identifies by the livid blue colour it has in the ape.

Although Galen identifies most of his muscles by their attachment, to Spigelius I believe belongs the honour of introducing the modern short method of referring to muscles by their origin-insertion. But Galen's descriptions have played a great part in the nomenclature which we use to-day.

Thus, having discussed whether the submenticular muscle of the neck was a muscle or a membrane, he decides to call it a 'muscle-like expansion'—*platysma myoides*—and this definition of its nature has given to it its modern name.

Again, in describing the attachments of the muscle of the top of the shoulder he compares them to the three sides of the letter Delta, and this has given the modern name to the muscle.

Similarly our *trapezius*, which Galen describes as two muscles, one part above the spine of the scapula and the other below, gets its name from the fact that Galen describes the upper part as a four-sided figure of the nature of a trapezium with one side at the occiput, one along the spine, one at the spine of the scapula, and the other a line connecting the ends of the horizontal lines at the occiput and the spine of the scapula. In other cases the Renaissance Latin translations of Galen's terms have been utilized by us. Thus, since he describes the median muscles of the abdomen as vertical in contrast to the oblique, the Latin translation of Galen's Greek (*rectus*) has been adopted by the moderns as the term for the muscle.

VIVISECTION

Galen acquired much valuable knowledge by the vivisection of animals. Indeed he has one of the books of the *Manual of Dissection* entirely devoted to this subject.

But even in his investigations on the action of muscle he makes use of this. In his account of the *trapezius*, which I intend to read later, he says its action is seen by the fact that after its division transversely across the neck the scapula is drawn downwards and cannot be again moved upwards, and that it is necessary to do this while the animal is yet alive.

Galen was a most accurate observer and a careful and painstaking dissector. Some of his other works, although of great interest historically,

consist largely of theories which have had their day, but the anatomical works will stand for all time as a record of things accurately observed and truly set down.

By taking the pains to remove the skin of the animal himself instead of leaving this to be done by a subordinate, he discovered the true attachments of several muscles whose origins or insertions are cuticular; for instance the plantaris, the palmaris, the muscle which rises over the skin of the loins and is inserted into the axillary fascia, and which has been called the axillary platysma; and, most important of all, he discovered for the first time and accurately described the platysma of the neck. Previous observers had missed this on account of only dissecting animals which had been strangled with a rope by an assistant instead of drowning them and dissecting them in person as Galen did.

Other muscles he discovered for the first time by dint of careful dissection, and among these may be mentioned the interossei manus and pedis. Of these he gives a most accurate description, surprisingly so considering the minute nature of the material he was working with.

Another muscle he discovered for the first time was the pterygoid mass, which, however, he does not divide into two muscles, as is done in modern anatomy, but he is under no delusion as to their function. He also discovered for the first time the muscle we know as the rectus capitis posticus minor. At times he seems to claim the popliteus as a discovery of his.

It is somewhat surprising to think that the modern natural historian can add little to Galen's description of the origins and insertions of the muscles, and of their functions.

I have compiled a list of the muscles described by Galen in the order in which he has described them in the *Anatomy of Muscles*, and classified as they are in that work. By the description given of them in the *Anatomy*, cross references in the *Manual of Dissection* and the *Utility of Parts* can easily be identified.

I have given them the names most commonly in use by natural historians at the present day. Galen, I have remarked, has no special nomenclature.

The list has been verified by the dissection of three specimens of *Macacus inuus*.

Muscle of the neck : Platysma myoides.

Muscles of the face : Zygomatici (as one), Quadratus menti, Pyramidalis nasi.

Muscles of the eyes : Suspensory, Superior rectus, Inferior rectus, External rectus, Obliquus superior, Obliquus inferior.

Forehead : Frontalis.

Moving lower jaw : Digastric, Temporal, Pterygoidei, Masseter.

From skull to scapula : Trapezius (upper half), Levator anguli scapulæ.

Other muscles moving the scapula : Omocervicalis or Levator claviculæ, Omohyoid, Trapezius (lower half), Rhomboidei, Latissimus dorsi.

Moving the head : Levator anguli scapulæ, Sternocleidomastoid,

Splenius, Biventer cervicis, Complexus, Rectus capitis anticus major, Obliquus superior, Obliquus inferior, Rectus capitis anticus minor, Rectus lateralis superior, Rectus lateralis inferior.

Muscles of trachea : Sternohyoid, Sternothyroid.

Larynx : Thyrohyoid, Thyropharyngeal, Cricoarytænoideus lateralis and posticus, Thyroarytænoid, Cricothyroid, Arytænoid.

Hand : *Five move fingers with oblique motions* : four lumbricales, Adductor pollicis. *Others are* : Abductor pollicis, Abductor minimi digiti, Interossei.

Between clavicle and ribs : Subclavius.

Of hyoid : Mylohyoid, Geniohyoid, Stylohyoid.

Tongue : Styloglossus, Geniohyoglossus, Myloglossus, Geniohyoid.

Pharynx : Thyropharyngeal.

Moving neck : (1) Posterior, Trachelo-costo-scapular ; (2) Anterior, Scalenii.

Between scapula and thorax : Serratus magnus.

Moving shoulder-joint : (1) Ascending from thorax, Pectoralis major (two divisions), Pectoralis quartus, Pectoralis minor ; (2) Ascending from flanks, Latissimus dorsi, Axillary platysma ; (3) From scapula, Teres major, Subscapularis, Supraspinatus, Infraspinatus, Teres minor. Shoulder, Deltoid. In joint, Coracobrachialis.

Moving elbow : Biceps, Brachialis anticus, Long head of triceps—External and internal head of triceps (as one), Latissimo-condyloideus.

Of forearm by which the radius and ulna are moved. *External* : Extensor communis digitorum, Extensor minimi digiti, Extensor of index, mesial and paramesial, Extensor carpi ulnaris, Extensor carpi radialis longior and brevior (Extensor ossis metacarpi II and III), Extensor ossis metacarpi pollicis (digital slip), Extensor ossis metacarpi pollicis (carpal slip to scaphoid and sesamoid), Supinator brevis, Supinator longus. *Internal* : Palmaris, Flexor sublimis digitorum, Flexor carpi ulnaris, Flexor carpi radialis, Flexor profundus digitorum, Pronator radii teres, Pronator quadratus.

Of thorax : *Expand*, Intercostals (by half their fibres), Subclavius, Slip of External oblique, Scalenus (I), Scalenus (II), Trachelo-costo-scapular, Diaphragm. *Contract*, Intercostals (by half their fibres).

Of spine : *Extend*, Spinales dorsi ; *Flex*, Rectus capitis anticus major, Psoas.

Of abdomen : Recti—External oblique, Internal oblique, Transversales.

To testicle : Cremaster.

At neck of bladder : Bulbocavernosus.

Of penis : Levator penis, Ischiocavernosus.

Of anus : Superficial sphincter, Deep sphincter, Levator ani.

Moving hip : Psoas, Quadratus femoris, Adductor magnus and its segments, Gluteus major and Ischiofemoris, Gluteus medius, Analogue of Pyriformis, Obturator externus, Obturator internus, Adductor slip to condyle.

Moving knee : Sartorius, Gracilis, Semimembranosus, Semitendinosus, Biceps (Condylar slip of Adductor magnus), Rectus, Vastus externus and Crureus, Vastus internus, Popliteus.

Of leg moving foot and the toes : Posterior, Gastrocnemius internal and external, Soleus, Plantaris, Flexor communis digitorum (fibular head). Tibial head, Tibialis posticus, Tibialis anticus, Slip of Tibialis anticus in apes to great toe representing Extensor longus hallucis, Extensor digitorum, Peroneus longus, Peroneus quinti digiti, Peroneus brevis.

Of foot: Superior surface, Extensor brevis digitorum; Sole, Lumbricales, Flexores breves digitorum (slips from tendons), Abductor minimi digiti, Abductor pollicis, Adductor pollicis; Midway, Interossei.

The following is a short description of the most interesting or difficult of these muscles:

PLATYSMA MYOIDES. Let him who wishes to practise himself in the dissection of the ape, having suffocated an ape in water, first skin it himself as has been described in the anatomical dissections. For many have erred in these things, handing over the work to chance comers.

These, moreover, lacerate and confuse many others and no less also the thin broad muscle, under the skin of the neck, which if any one prefers to call not a muscle but a muscular nature or substance, or however any one wishes to name it, thus he may do.

This muscle begins in front from the regions about the lips and the lower jaw, behind from those about the spine, lying stretched in a circle under the skin round the neck, being thin and membranous, so that by this it escapes notice. And it seems to be a membrane rather than a muscle since it mingles with the skin, but if it is separated off from it, it becomes apparent. But no joint is extended by this muscle since it is inserted into no bone, but it moves the cheeks and the skin to which it is fused, and before dissection the motion of it is clear in ourselves, when we care to abduct from each other the cheeks, without moving the lower jaw or opening the mouth. And in these in the state of spasm this muscle is the first to be extended. And what are called 'cynic spasms' are especially a disease of it.

Let it be called by us for the sake of clearness of teaching platysma myoides (muscular expansion). It lies then round the whole neck and passes down as far as the clavicle on each side along the spine of the scapula as far as the beginning of the thorax. And the part of it between the insertion and the muscular head being membranous, lies vertically along the spine of the neck. This body has been ignored by anatomists, the skin of the animal being badly flayed.

Galen thus claims to have discovered the platysma. Its attachments, it will be noted, are much wider than in man. In other places he says that the action of the slips inserted into the mouth draw it together after the manner of a purse which is closed by pulling on strings.

SUSPENSORY MUSCLE OF EYE (CHOANOID). This is only seen in animals lower than the monkey. It is especially marked in animals which feed with the head downwards. It surrounds the eyeball completely in a circle and supports it in that position of the head.

PTERYGOIDS. Galen discovered these. He does not distinguish them into two as we do, but he is under no delusion as to their action.

TRAPEZIUS. As has been remarked, he counts on trapezius as two muscles, one above the scapula, one below. The term for the shape of the upper segment has been applied to the whole sheet, although that is by no means of the shape of a trapezium.

OMOCERVICALIS OR LEVATOR CLAVICULÆ OR TRACHELO-ACROMIALIS. A muscle passing from the first transverse process to the acromion. When the fore limb is fixed in progression it pulls the head to one side.

RHOMBOIDEI. This sheet is taken as one.

THE STERNOCLEIDOMASTOID. The special motions which the head has without the neck are very small and are double, as being at two joints, the one for rotation to each side, and the other for nodding back-

wards and forwards. But the movements of it along with the whole neck are of great extent, and afterwards I will explain them.

Now a description will be given of the special muscles of it. Next after the aforesaid pair of the slender muscles which I said drew up the scapula (*levator anguli scapulæ*) rising from the occipital bone, there is another having its origin transverse and fleshy and broad as far as the ears.

And there rises connected with it another having its origin from the parts below the ear itself, and these pass obliquely through the whole neck to the front.

At their first origin they are moderately coherent, but in the succeeding space they are separated rather, and thus it may seem to some that there are two muscles on either side of the neck, not one. And the use of each, and the motion, and the arrangement of the fibres are similar.

And they differ in one thing only that the fibres of the first muscle at its first origin, being fleshy, remain so till they pass into the clavicular bone, and that those of the second being like a ligament at the beginning, are like a tendon at the end which reaches the sternum. And this second muscle can be dissected by itself, if any one care to cut the matter so fine. For it divides in a way round the neck so as to lie along it and be in contact with the parts meeting it. The other, the anterior one, is inserted into the beginning of the clavicle. It lies between this insertion at the sternum, and the aforesaid origin at the occiput. This *whole* muscle then must be considered as one in action and function. The motion of it is oblique, and the action of it is to draw the head forward. But it is not one in that it remains continuous, and lying all straight from its origin to its insertion, for it has two origins, the one fleshy from the occiput, the other more tendinous from the ear.

And the insertions, as has just been described, are the fleshy one situated at the clavicle, and a tendinous one attached to the sternum. But about these anatomists have made no great errors, for to think that the whole of these from the occiput are inserted in the clavicle is not far from the fact.

And this has been said by Lycus, and also by certain other famous men, but this muscle is not only not attached to the whole of the clavicle, but not even to half of it.

This pair of muscles, then, is quite large, so that even before dissection it can be quite clearly made out, and especially in athletes.

RECTUS CAPITIS POSTICUS MINOR. Galen discovered this muscle. It is one that requires particularly careful dissection to distinguish it from the *Rectus capitis posticus major* in the monkey, for, as Galen says, the first two vertebræ together present the appearance of one, the spine of the second being situated in a straight line with the lateral processes of the first. The posterior muscles lying on the smaller pair conceal it.

They are inserted into the posterior aspect of the first vertebra just as also those which are before them (*Rectus capitis posticus major*) are into the second.

And if you abrade no fibre of the underlying small muscles (*Rectus capitis posticus minor*) they will be seen to have their own special outline.

But if you touch them at any part and cut them they will seem to be attached to the overlying.

This discovery of these little muscles placed the knowledge of the occipito-atlantoid group on the same footing as it is to-day. They are

so exceedingly minute in the monkey that their first discovery is very creditable.

LARYNX. The dissection was performed usually on the ox. The description and enumeration of these little muscles is singularly up to date.

INTEROSSEI. The muscles of the hand are curiously, owing to some mistake in the manuscript, inserted out of their natural position.

He says other dissectors missed these, as even he himself did for long.

For unless one takes away first of all the seven muscles he has just described (corresponding to our four Lumbricales, Adductor, and Abductor pollicis and Abductor minimi digiti), no one of these small muscles will be seen. But these others being removed, a certain continuous fleshy body is seen, consisting of all lying together, requiring very careful separation to define the muscles from one another.

They are two for each finger, which come down to the first joint on its inner aspect and also reach the sides of it.

Wherefore they do not cause rigid and undeviating flexion of all, but make gentle inclination to the side, so that each one of these when put on the stretch moderately bends the first joint along with slight inclination of it, but both at each finger being put on the stretch together they make straight and undeviating flexion.

All rise from the ligament joining the carpus and metacarpus near the articulation, except those of the thumb which take origin higher, but also from a ligament, not the one joining the aforesaid bones, but the one which binds down the two great muscles by which the fingers are flexed (*Flexor sublimis digitorum* and *Flexor profundus digitorum*).

In the same way Galen was the first discoverer of the *Interossei pedis*.

The discovery of these little muscles is a triumph of the dissector's art considering the minuteness of the material he was working with in the ape.

TRACHELO-COSTO-SCAPULAR. A muscle rising from all the vertebræ inserted into the base of the scapula. It pulls the scapula forward when the animal is walking on all fours. It is much developed in the great beasts of prey.

PECTORALES. This is rather a puzzling sheet to interpret in terms of human anatomy.

There are four divisions in Galen's description.

The major he thinks best considered as two separate muscles. The fibres rising from the upper parts of the sternum are transverse, the lower slightly oblique. (There may be a hiatus between these two divisions.)

The third is the *Pectoralis minor*. It must be remembered that this muscle does not reach the clavicle in the ape but is inserted on the humerus.

The *Pectoralis quartus* rises over the lower part of sternum and part of the linea alba.

It is a lamination of the same sheet as the major.

AXILLARY PLATYSMA. This is one of the muscles of which Galen claims to have shown the true nature and origin.

It rises from the skin over the flanks and narrows into a long narrow strip inserted into the axilla. It is highly developed in some animals for shaking the skin of the back to free it of irritating objects.

LATISSIMO-CONDYLOIDEUS. This is an interesting muscle sometimes appearing as an abnormality in man. It comes off the tendon of the

Latissimus dorsi and is inserted into the outer condyle. It brings the elbow into connexion with the back in leaping.

It is one of which Galen remarks that it is only to be found in apes.

Max Simon appears to allot this to the Anconeus externus, but that is only a short muscle though well defined in apes. But this muscle Galen expressly states is inserted 'into the tendon of the largest muscle of the back' (Latissimus dorsi).

In brachiation the Latissimus dorsi, the latissimo-condyloideus, and the biceps contract and the body is brought to the hand for leaping.

SECOND EXTENSOR LAYER OF FINGERS. It is impossible to distinguish this layer, which is additional to the Extensor communis digitorum in terms of human anatomy. Perhaps the simplest way of interpreting the description given in the anatomy of muscles is to say that Galen recognizes the extensor longus pollicis as a separate muscle, as also the extensor minimi digiti, and that he counts the extensor indicis with its slips to the middle finger and the paramesials as one muscle controlling these three fingers. He gives a rather different description in the *Manual of Dissection* and in the *Utility of Parts*.

FLEXOR LONGUS POLLICIS. In the ape this is represented by a slip from the Flexor profundus digitorum.

EXTERNAL OBLIQUE. An interesting description of the inguinal canal is given.

'In this place the muscles are perforated and there passes out by the foramen the muscle passing out to each testicle, to which the name cremaster is given, and along with this the spermatic vessel and a vein and an artery and the offshoot of the peritoneum.'

OF THE MUSCLE DESCENDING TO THE TESTICLES. 'Two small muscles pass to each testicle. One takes origin from the pubis, and the other from the bone of the ilium by a fine tendon. They pass along thence one to either side of the canal leading to the testicle, and there flattening out they surround the red membrane. Their use is to raise up the testicles, hence some call them cremasters.'

OF THE MUSCLES OF THE ANUS. 'The outer end of the rectum has mixed with its cuticle a muscle, so that it may either be called a muscular cuticle or a cuticular muscle, and it is easiest found in the anterior parts.

But another muscle exactly circular encircles the anus horizontally, closing it strongly and accurately when it is put on the stretch, touching the bone of the coccyx at its centre, and ending on each side in the origin of the penis.'

ADDUCTOR MASS. A puzzling muscle to interpret was a slip of this muscle which is not really distinct from the mass, but which being in contact with the inner head of the gastrocnemius has some effect on the tibia and therefore, according to Galen's classification, requires separation from the rest of the mass, which acts only on the femur.

POPLITEUS. Here and there Galen seems to take entire credit for the discovery of this muscle; at other times he is not so positive, only claiming to have elucidated its action. Galen says it is the strongest flexor of the joint there is.

TIBIALIS ANTICUS. The slip to the great toe which replaces the flexor longus hallucis is a wild beast distinction, and Galen notes this as a difference between man and the ape.

FOOT. The description of the muscles of the foot itself is rather disappointing as he merely compares it to the hand. The difference, of course, is not great in apes. As has been said, he discovered the interossei of the foot.

'MANUAL OF DISSECTION'

In searching for a typical extract of this work I have chosen the following as embodying the most characteristic of Galen's methods.

It is his description of the dissection of the muscle which we know as the trapezius, or rather the part of it which is attached above the spine of the scapula. The lower half Galen considers as a separate muscle.

The following points are to be noted in the description :

His clear and definite description of the attachments.

His description comparing the outline of the muscle to a mathematical figure has given the name to the modern muscle mass.

He recommends vivisection as necessary for the elucidation of the action of the muscle.

It displays a knowledge of the anatomy of animals lower than the ape.

He demonstrates that others are wrong in their conceptions, but modestly disclaims any intention of imputing blame to them for their ignorance and still less of getting drawn into an argument with their supporters, merely remarking that every one will know that he is right while their books are full of blunders.

First of all there appears superficially the broad muscle, almost a triangle, of the shape geometers call of the trapezoid figure. You will understand what I say better if you cut a right-angled triangle by a straight line, parallel to the base. Of the lines joining these, there is one perpendicular to both, the other oblique. The line perpendicular to both rises from the spine of the neck. The base of the whole figure is the spine of the scapula. Parallel to this is a small line on the occipital bone of the skull, which is near to the first vertebra. That which joins this with the end of the base—the fourth side of the muscle—the oblique one, passes to what is called the acromion, slightly attached also to the end of the clavicle there. Proceeding to dissect this muscle, then, begin with the uppermost line, which, rising from the middle bone of the skull at the occiput, stretches transversely across to, as it were, the root of the ear at that side. It is plain, however, to any one that this muscle is a single one on either side of the spine. Neither of them reaches to the ear, but each stops as far short of it as the distance they have come from the occiput. Divide it along the first origin by a transverse incision which will free it from the skull, then putting in a hook dissect it from the underlying parts. Proceeding downwards along the aforesaid boundaries which are both the one along the spine of the vertebræ of the neck, and the oblique side of the trapezoid figure which reaches to the clavicle not far from the acromion. This having been accomplished this muscle is seen to be inserted into the spine of the scapula.

If you try to pull on the part by means of the muscle, each scapula follows in like manner. Wherefore it is better to consider that this muscle has been formed by nature for the sake of the scapula and not of the skull.

First, because after its division transversely across the neck the scapula is drawn downwards, and cannot again be moved upwards. It is necessary to do this while the animal is yet alive.

Secondly, there are other muscles producing movement of the head to the side, but this alone draws the scapula up towards the head. Wherefore, if we remove the latter also from it, it is quite deprived of such movement and it possesses it plainly. Is there any muscle doing the same? And if there is any—but there is none—of necessity it is this.

And a third reason in addition to the aforesaid is that in long-necked animals this muscle does not reach to the skull but is completely triangular, the straight line connecting those about the right angle beginning at the lower part of the neck and ending before it reaches the occipital bone. For nature would have done this in vain—and nature does nothing in vain—to take up to the skull a muscle which would plainly have been able to raise the scapula even if it had ended lower by means of the movement of the spine in its neighbourhood in these animals, and its length in the neck would have been extraordinary.

A fourth proof that the scapula is moved by it, is the nerve which comes from the brain. And if any one cut it, the aforesaid movement of the scapula is paralysed, but not that of the head, although the book of Lycus on the scapula says that the head is moved by it. But when he wrote that, he was aware neither of the nerve nor of any of those things I have spoken of.

But it is not part of my plan to argue with Lycus nor with any of the older men except incidentally, for I know that to any one fond of study, and desirous of finding the truth, the books of the others will appear full of many blunders.

[Tuesday Morning, August 12]

SECTION XXIII

HISTORY OF MEDICINE

INDEPENDENT PAPER

THE SCOTTISH COLLECTION OF GAELIC MEDICAL MSS.

BY PROFESSOR DON. MACKINNON

THE Gaelic Medical MSS., whether preserved in Ireland, Scotland, or elsewhere, have this feature in common—they are all, or nearly all, of foreign origin. No important MS., so far as hitherto ascertained, is of native production. There are frequent paragraphs on the margins and blank spaces in elucidation or correction of the main text, many of which are written in the first person. These in many cases contain, without doubt, the result of the writer's observation and experience. But one is not always certain that the paragraph may not be culled from some MS. now unknown to us.

Further, these MSS. are all practically translations or versions made from Latin. Many of the medical treatises turned to Gaelic were originally the work of the early Greek physicians and philosophers, while others were the compilations of members of the Arabian school. But it may be taken as practically certain that they were translated not from Greek or Arabic, but from a Latin version. Again, the greater number of these MSS. are versions in whole or in part made from the productions of the early Latin physicians, and especially from the more authoritative treatises issued from the great mediæval schools of Salerno, Montpellier, and others, all, or nearly all, of which were originally written in Latin.

The Gaelic physicians, in Ireland as in Scotland, were, as a rule, attached to the great nobles of the country. As was the custom among these people in old times, the physician, like the poet, judge, and other officials, held his office hereditarily, was held in high honour, and was substantially recompensed. It is to the professional and literary zeal of these men that we owe the medical MSS. They did not always themselves translate them. They selected the treatises to be turned to Gaelic, whether *in extenso* or in abstract, but they frequently employed competent scholars of Latin and Gaelic to do the work. The oldest dated translation that I have come upon is 1403, but there may be several earlier. As we have them now, some of the surviving copies are of the

fifteenth century, and a few of the seventeenth, but the greater number date from the sixteenth century.

Copies were made of the MSS. considered of most value by professional transcribers, who were selected not for their learning, but for their penmanship. I am not aware that any of these old MSS. was ever printed. The number of possible purchasers would be at best but few; but the Gaelic-speaking people older and later did not take too kindly to the printing press. Many of the copyists were evidently quite ignorant of Latin, and their command of their native Gaelic was not always perfect. They wrote the literary language common to Ireland and Scotland in their day as best they could. The greater number of them were resident in Ireland, and much the larger number of the MSS. now in the Scottish Collection were translated or transcribed in that country. But these scribes seem never to have forgotten that they were simply copyists; they frequently apologize for their inferior penmanship, but no notice is taken of slovenly composition or inaccurate translation.

The Gaelic physicians of Ireland were necessarily more numerous than those of Scotland, and a larger number of medical MSS. must have circulated among them. In other departments of study—in genealogy, annals, history, and theology, for example—the preserved Gaelic literature of Ireland is much more voluminous and important than that of Scotland. But for some reason or other our collection of medical literature in Edinburgh is exceptionally rich. Thus there are in the Advocates' Library Collection sixteen MSS. wholly medical, and five or six partly so. There is a large medical MS. in the library of the Scottish Antiquaries, another in that of the university, and three in my own possession. Besides, two at least of the medical MSS. now in the British Museum were at one time possessed by the Gaelic physicians of Scotland.

As they have come to us, these documents are of all sorts and conditions, shapes, and sizes. The older are, as a rule, written on vellum, the later largely on paper. From want of cover and rough usage, the outer pages are frequently illegible. MS. IV, e.g., is a tiny vellum, the page being only $2\frac{1}{2}$ inches by $1\frac{3}{4}$ inches, while the page of MS. X measures 15 inches by $10\frac{1}{2}$ inches. MS. IX consists of a single leaf of faded paper, containing a prescription for strangury and a fragmentary genealogy of the MacDougalls of Dunolly, while that in the library of the Scottish Antiquaries is a large folio volume containing 714 pages. Many of the MSS., like II, XII, XIII, and others, are made up of a number of separate MSS. or parts of MSS., sometimes of vellum, sometimes of paper, occasionally of both, roughly stitched together with stout thread or thong. Some of them are carelessly written in an inferior hand, while many others are highly artistic, the handwriting wellnigh perfect, capitals elaborately ornamented, and, except upon the outer page, with the colours as fresh as on the day they were written.

To speak in general terms—the contents of these medical MSS. are as comprehensive and diversified as a layman could in reason look for.

As is well known, the old and mediæval physicians included within the range of their professional studies not only medicine and surgery as we understand these terms now, but the whole round of the sciences as then known—philosophy, metaphysics, physics, mathematics, astronomy, and astrology. These documents furnish us with continual incursions into these regions, the problems propounded and the discussions regarding them characterized by the ingenuity and acumen so congenial to the mediæval mind. Within the field of medicine and surgery the medical department receives much fuller treatment, although the surgical is by no means neglected. Thus in a layer of MS. II there is a full paragraph from Hippocrates, who is described as ‘the key of all knowledge’, ‘On the Conditions of the Cautery’. MSS. XXXIII and LX contain an abstract of Galen’s ‘Anatomy’, executed, according to Dr. Donald Smith, ‘with much judgement’. The first layer of MS. XII is exclusively anatomical, and among the authorities cited are Galen, Avicenna, Lanfranc, and Guido. Chapters on wounds and their treatment are frequent, and an especially interesting tractate, attributed to Joannes de Vigo Genuensis, and entitled, ‘Of the wound made by a bullet, and by every agent similarly propelled’, is found in MS. LX. Frequent paragraphs are also devoted to blood-letting, whether by lancet, cup, or horn, the veins to be opened, and the proper seasons and days for the operation.

But the medical side of the subject is considered in much greater detail. The enumeration and classification of diseases are, especially in the larger MSS., most full and elaborate. Equally so are the remedies prescribed for each disease in its several varieties, and at every stage in its development. Questions of climate, of diet, of nursing and kindred topics are largely discussed. The preparation of drugs and the proper administration of them occupy much space. An interesting chapter is devoted in MS. LX to the proper method of weighing and measuring drugs. Specific remedies for special ailments are not infrequently noticed. Thus mention is made of a *recipe* used by the women of Salerno to promote fecundity; of an eye-salve which restored his sight to a man who had been blind for twenty-five years; of a ‘precept’ on the virtues of rosemary, which the writer had received ‘from an old Saracen physician’; of a specific for epilepsy ‘which a demon who had come to her in the guise of a man gave to a woman’; a cure for pleurisy which professes to be taken ‘from the *viatic* which Hippocrates discovered, and which was laid down in that form by Constantine’. While chief reliance for effecting a cure is placed on the special treatment recommended, other accessories to make the prescription more efficacious are frequently recommended. One of the more orthodox and pious physicians, after describing the composition of an emplaister, adds: ‘Apply this to the neck, and it, by the grace of God and the (healing) Art, heals the sore called Quinsy.’ Another at the opposite pole of faith devotes a paragraph to ‘Wizardry and Heathenism’ as an aid to Science. But the favourite ancillary remedies of this kind are charms of various kinds carried about the

person, incantations, the invocation of a saint's name, a *pater*, &c., &c., faith in the virtue of which is not yet wholly extinct among us. Several theories which of old were believed to influence powerfully the health of the individual—the elements, the planets, the doctrine of the Humours, the Degrees—are subjects of frequent and lengthy exposition and discussion. Calendars are frequently prefixed to the medical MSS. In addition to the customary tables and 'obits', rules are commonly added to ascertain the Dominical Letter and Golden Number, while the margins are frequently covered with notes on the probable course of the weather during the several months, and the foods and drinks most suitable in each. A considerable portion of this kind of lore is probably of native origin.

For the production and preservation of the Scottish Collection of Gaelic Medical Literature we are indebted in the first instance to two families of Irish descent who practised medicine in the Highlands of Scotland for several centuries. The first and much the more distinguished of the two was of the name in Gaelic of *Mac Bheathadh*, literally, 'Son of Life,' not an unhappy name, it must be allowed, for a physician. The name came to be written in Latin *Betonus*, and in English (Mc)Beath, later Beaton. In Skye and the Southern Isles this surname is now pronounced *Pe(u)dan* and *Bi(o)tun*. A pedigree of the family is written by one of them in the medical MS. in the University of Edinburgh (Laing No. 21, fols. 102b, 103a), to which the compiler adds the following note, with which I venture to say few readers will agree, *De his rebus satis dictum et scriptum per me Christopherum McVeagh* (= Bheath). The writer names six men who must have been alive in his day, and were presumably physicians. He traces these six up step by step to a common ancestor, Fergus the Fair. He then takes up Fergus the Fair and traces him back in the same way to Beatha, the eponymus of the family, and adds that he came from the land of O'Cathain or O'Kane in the neighbourhood of Dublin. Finally Beatha is taken up and traced back from son to father step by step to Neil of the Nine Hostages, Monarch of Ireland. A Fercos McBetha witnesses a charter dated 1408 by which Donald of the Isles, who three years later fought the Battle of Harlaw, granted certain lands in Islay to a *Magaodh* or Mackay. It has been suggested that this Fercos is the Ferghus Finn or 'the Fair' of the pedigree. Again, Angus òg (the Young or Junior) of the Isles, the friend and powerful supporter of Robert the Bruce, married a daughter of O'Cathain or O'Kane, and it has been an old tradition of the Isles that the dowry which the bride brought to her Highland home was 24 young gentlemen from her father's estates in Ireland. Beatha or Beda was, according to the Sleat historian, one of these 24. One need not guarantee the accuracy of all the descents in this pedigree, nor the exact date of Beatha's settlement in Islay. But there is no reason to doubt that the family was Irish; that one of them settled early in Islay in the service of the Lords of the Isles as physician;

and that his descendants continued in office as long as the Macdonalds held possession of that historic isle.

Tales of the marvellous skill and sagacity of these physicians float about Islay and Mull to this day. A persistent tradition bears that in a grave emergency the Islay *savant* was summoned to the bedside of the King of Scotland, and that the Highland *ollamh* effected a cure where the Court physicians who unworthily tried to baffle him failed. An old Gaelic quatrain refers to the incident thus :

‘ A message came from the King,
Saying he was at death’s door ;
The Doctors’ stratagems were of no avail,
Their treachery of no effect.’

In evident corroboration of this old tradition, it is on record that in 1379 Prince Alexander Stewart, otherwise known as the Wolf of Badenoch, granted to Farquhar, who is described as *medicus regis*, valuable lands in the north of Sutherlandshire, and in 1386 to the same person, now designated Ferchard Leiche or the Leech, all the islands from Stoer Head in Assynt to Armadale Head in Farr, in the same county. Sutherland tradition has it that the highly recompensed Doctor was an Islay Beaton.

The McBeaths of Islay flourished. Members of the family spread, as physicians, from the native seat to Mull, Skye, and the Uists in the Isles ; to Sutherland and the Aird of Lovat on the mainland, probably elsewhere also. [It is but right to add that the Skye branch, who usually spell their name Bethune, claim descent not from the Islay McBeaths, but from the Bethunes of Balfour in Fife. The matter is not quite free from doubt, but on the whole there seems no sufficient reason to separate the Skye Bethunes from the Islay, Mull, and Uist McBeaths or Beatons.] John Beaton of Mull died in 1657, and Donald Beaton erected an inscribed stone to his memory in Iona in 1674. Fergus Beaton was in practice in South Uist about 1700, and possessed the following MSS. : Avicenna, Averroes, Ioannes de Vigo, Bernardus Gordonus, and several volumes of Hippocrates, some of which no doubt form part of the collection in Edinburgh now. The Islay physician was called the Chief Physician of the Isles. The office was highly endowed, and the holder of it highly honoured. By the commencement of the seventeenth century, it became manifest that the Macdonalds, who by their own tradition had possessed Islay for 1,000 years, were about to lose it for ever. The great Lordship had been forfeited for upwards of 100 years, but the Islay branch of the family still held a large part of Islay and Kintyre. When the Lordship fell it was one of the McBeaths, Donald son of the Ollamh, who bewailed the event in a poem commencing :

There is no joy without the Macdonalds.

In 1609 (the Macdonalds finally left Islay in 1615), Fergus McBeath, the physician of the day, had sufficient interest and influence with James VI

to secure from that monarch a charter confirming him in the office of Chief Physician of the Isles with all the rights and privileges thereto belonging, and in the lands of Balinaby, Saligo, Ereset and Howe, which he held hereditarily in virtue of his office from Macdonald *ab omni hominum memoria*, lands which are valued now at about £600 per annum. Fergus's son John sold these lands in 1629 to the Lord Lorne of the day. The McBeath charter accordingly went to Inveraray, where it has fortunately been preserved. It was printed for the first time in the Book of Islay in 1895. As showing the position which McBeath or Beaton held at Macdonald's Court the following anecdote related by the Sleat historian is of interest. At a general gathering of the Western Chiefs in Aros Castle in Mull, Macdonald of Clanranald persuaded Maclean of Duart, the chamberlain, to allow him to seat the chiefs at Macdonald's table in order of precedence, his object being to affront certain of their number. 'He first asked MacIain of Ardnamurchan to sit down. . . . Then he asked Mackinnon and Macquarrie to sit, for Macquarrie was an ancient Thane. Then he desired Beaton the principal physician, then MacMurrich the poet, to take their seats. "Now," saith he, "I am the oldest and best of your surnames among you, and will sit down: as for these fellows who have raised up their heads of late, and are upstarts whose pedigrees we know not, nor even they themselves, let them sit as they please." The *seanachie* adds that 'Maclean, Macleod of Harris and Macneill of Barra went out in a rage and very much discontented'. Clanranald's object was no doubt to insult these powerful chiefs; but his arrangement on that occasion shows that in order of precedence the chief physician and chief poet immediately followed the chiefs of the old houses, the physician, at Macdonald's court, taking precedence of the bard.

It is to the professional and literary zeal of this distinguished family that we owe nearly all the medical MSS. now in the Scottish collection. Several of the MSS. were written by or for one or other of them, while their names and initials are inscribed profusely on the margins and blank spaces of nearly all of them.

The other family to whom we owe a few of the Gaelic Medical MSS. were the O'Conachers, later McConachers, of Lorn. In Gaelic the name was written *Ua Conchubhair*, now in Irish-English O'Connor, one of the oldest and most distinguished of Irish surnames. The family was without doubt Irish, but when and on what terms they came to settle in Lorn as physicians is unknown to me. They acquired lands in feu around Loch Feochan, some 3 to 4 miles south of Oban, from Argyll and Breadalbane, and one of the family appears in record as early as 1530. Latterly they lived at Airdoran on the north shore of Loch Feochan. Toward the end of the eighteenth century McConacher of Airdoran appears to have got into money difficulties, and in 1799 the little estate was purchased by MacDougall of Gallanach, a neighbouring proprietor. The ruins of the old house are still traceable, as also the

garden in which these physicians reared medicinal plants, and a cup in an adjoining rock in which they used to pound these. The McConachers of Lorn did not attain to the distinction of the McBeaths. But one of the family, John, son of Donald, describes himself as 'the inferior scribe who wrote this in the house of the Lord of Ben Edar (the Hill of Howth)' and adds as if home sick, 'far from my country am I this day.' Another member of the family, Duncan McConacher, was in Ireland in 1596-7, in part at least at the instigation of MacDougall of Dunolly, where with the help of friends he wrote a copy of Bernard Gordon's *Lilium Medicinæ*. The same man or a namesake commences another treatise on January 14, 1598, his purpose being to reproduce in clear and concise form the teaching of Avicenna, that 'glorious prince' as Avicenna is here designated. MS. LX, one of the largest and most interesting in our collection, was written in Lorn in 1611-14 by Angus, son of Farquhar, son of Angus, for Duncan McConacher, probably the same person. The initials of one or two others of the family appear on several other MSS., showing that these were at one time or other in their possession. Dr. Donald O'Conacher seems to have been a man of mark. He was brought, about 1639, from Lorn to Irvine to attend one of the Argyll family.

In my judgement a treatise on what we would now call *Materia Medica*—a list of the articles, animal, vegetable, and mineral, from which drugs were made, with their medical properties, whether single or in combination with others—is, from the point of view of to-day, the most important and interesting in the whole collection. A note regarding this tract may not be deemed out of place.

The Gaelic physicians placed great value on this document, and no fewer than six copies of it are known: there may, of course, be others.

1. There is a very imperfect copy in the British Museum, containing only 167 entries or articles. This copy was first noticed by Dr. Norman Moore in a valuable paper printed in vol. xi of the Bartholomew Hospital Reports. Mons. Henri Gaidoz and Dr. Whitley Stokes wrote short notices about it in vols. vii and ix of the *Revue Celtique*. Thereafter Mr. Standish H. O'Grady described it and extracted from it in his *Catalogue of Irish MSS. in the British Museum*, pp. 224-31. Further extracts from the same copy were printed by Dr. H. C. Gillies in the *Caledonian Medical Journal*, vol. viii, pp. 102, 143. It has been suggested, although the evidence is inconclusive, that this was a Beaton MS.

2. A copy in the Haigh Hall Library, containing 285 articles. This copy is described and quoted from by Dr. Stokes in *The Academy* of May 16, 1896. From several entries in the MS. regarding the Macdonalds of Islay and the Glens (of Antrim) one would infer that this copy at one time belonged to the McBeaths of Islay.

3. A copy in MS. III, Advocates' Library. This copy contains 286 articles, and is undoubtedly a Beaton MS.

4. A copy in MS. LX in the Advocates' Library, containing 312 articles. This copy was written in Lorn in 1611-14 for Duncan O'Conacher.

5. A copy in my possession, very defective. It contains only 167 articles. It is old, but there is no mark to indicate date, author, translator, scribe, or owner.

6. A copy in Ireland, dated 1416 (v. O'Reilly's Account of Irish Writers, Dublin, 1820).

The articles in all the copies are written on a uniform plan, revealing a common source. They are arranged under their Latin names alphabetically under the letters A, B, C, &c., but the alphabetical order is not maintained within the several letters. Thus the first article under A is *Aron barba*, while the second is *Acasia*, and the third *Absint*. The copy in MS. III, which is now defective, gave an index in Gaelic preceding each letter, naming in their order the several items treated under it. The index is said to follow Platearius.

Then follow the names, first in Latin, thereafter in Gaelic. The 'quality' and 'degree' come next, after which the medical properties are enumerated. *Iris*, e.g., is thus treated. '*Iris* i.e. *gloiriam*. It has three names, *ireos*, *glaidinus*, and *iris*. The flower of *iris* is purple, while that of *ireos* is white, and of *glaidinus* saffron. This plant is hot and dry in the second degree. If its root be gathered in the end of spring it preserves its virtue for two years. It has a laxative diuretic virtue, and it removes the obstructions of the spleen, the kidneys, and the bladder. It is a powerful remedy against troubles of the respiratory organs, and stomach ailments that proceed from flatulence. Its powder put on sores checks proud flesh and cleans them.'

Here is a note on *Margarita*, i.e. *nemaind* 'pearl'. 'This stone is cold, dry, and is found in a shell. It is formed thus. When the shell opens it takes in its fill of poisonous dew, closes around it, and turns it into stone. The pearl that has a natural hollow in it is best, if also white. It is comforting in heart affections, and is put in electuaries. And if you wish to make the pearl white, give it to a pet pigeon to eat, and let it be left in its crop for three or four hours. Then cut up the bird and remove the stone, and it will be pure, clear, brilliant thereafter.'

Although the publication of this tract would probably add very little if any to our knowledge of medicine or botany, still it appears to me that if a competent Gaelic scholar with a good knowledge of botany could be found to undertake the work, a very interesting volume might be produced. The Beatons of Mull and Skye and the O'Conachers of Lorn are known to have cultivated medicinal plants, and to have made some at least of their drugs from them. It was the belief of Dr. Stokes, Mr. O'Grady, and others that this tract was so far of native origin. But the colophon appended to the copies in MSS. III and LX largely discounts this view. Here is the colophon to MS. III (that to MS. LX is practically to the same effect): 'And thus we bring to a close in a praiseworthy, concise, and profitable manner this book which has been extracted from the

Antidotarii ¹ and specimens of the city of Salerno, and the kindred researches of the Doctors of Montpelier.' Still it is to be noted that the latest copy of the six we possess (that in MS. LX) contains the greatest number of articles, and that several of the articles common to the six are fuller in that of MS. LX. It is thus possible that a careful comparison might show that the native physicians made some original contributions to the Gaelic pharmacopœia.

These old documents, one need hardly say, add little or nothing to the medical science of our day. But in the history of the Gaelic language and literature, and as evidence of the culture of the Gaelic-speaking people, their value is very great. One wonders to what extent the views of writers like Dr. Samuel Johnson, Lord Macaulay, and Mr. Hill Burton would have been modified if they had known anything of the McBeaths and their work.

¹ Antidotarius est liber contra vitia et morbus. Ducange (ed. 1883), s.v.



[Tuesday Morning, August 12]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

LES APOTHICAIRES PRIVILÉGIÉS DANS
L'ANCIENNE FRANCE

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IL y avait dans le Paris d'avant la Révolution deux sortes — il faudrait dire deux sectes — d'apothicaires, non seulement tout à fait dissemblables, mais encore animés l'une contre l'autre d'une haine inextinguible, qui se traduisit par un nombre incalculable de procès.

Ces deux corps ennemis sont d'une part la corporation bien connue des maîtres apothicaires-épiciers de la ville et faubourgs de Paris, qui depuis le ^{xvi}^e siècle tenait ses assises dans la maison de la Charité Chrétienne, au delà de la montagne Sainte-Genève, d'autre part l'ensemble des praticiens désignés sous le terme global d'apothicaires privilégiés ou titulaires de charge. Ces derniers ont été complètement négligés des historiens, et je les aurais presque ignorés moi-même si l'érudition toujours complaisante de M. le docteur Dorveaux ne m'avait conduit vers eux presque par la main.

J'ai réuni déjà beaucoup de notes sur la question et je compte en tirer dans quelque temps une étude critique et détaillée. Ce que je vous présente aujourd'hui n'est donc qu'un aperçu d'ensemble, et vous m'autoriserez, pour le rendre encore plus bref, à vous le donner sans références. Il me suffira d'indiquer que j'ai puisé la plus grande partie de ma documentation à l'École supérieure de Pharmacie de Paris (Archives), aux Archives Nationales (série A D), à la Bibliothèque Nationale (série T 18) et dans les *Recueils de privilèges* publiés par les soins des intéressés eux-mêmes en 1688 et 1768.

Certains font remonter à Charles VII, d'autres jusqu'au ^{xii}^e siècle, l'institution des marchands privilégiés. Point n'est besoin de textes pour affirmer que l'origine est plus ancienne encore. Dès qu'il y a eu une cour, et qui se déplaçait, il y a eu des marchands 'suivant la cour', et dès qu'il y a eu des marchands habitués à suivre la cour, il y a eu des marchands 'privilégiés'. Car le roi, voulant être bien servi, cherchait à s'attacher par des bienfaits ceux qui entreprenaient à sa suite un voyage coûteux et pas assez rémunéré par le négoce. Le fait est certain, puisqu'en 1386 Charles VI menaçait par une ordonnance ceux qui prenaient indûment le titre de 'commensal du roi' pour esquiver l'impôt.

Des déclarations renouvelées confirmèrent en 1543, 1610, 1611, 1612, 1638, 1642, 1648, 1667, etc., cette exemption de tailles, d'aides et même de péages. Seul l'impôt de la capitation vint atteindre les privilégiés au XVIII^e siècle. En fait ils sont presque au rang des gentilshommes tout le temps qu'ils possèdent leur charge. N'ont-ils pas le droit de porter l'épée et de prendre un casque timbré de leurs armoiries ?

Autre avantage dont nos marchands sont très jaloux : celui du *committimus*, en vertu duquel ils peuvent faire juger tous leurs différends par le prévôt de l'hôtel ou grand prévôt de France qui est en quelque sorte leur chef immédiat ; en cas d'appel, le Grand Conseil est leur juge suprême. Cette prérogative est importante parce que ces juridictions d'exception se montrent beaucoup plus favorables à leurs clients que ne seraient le lieutenant général de police et le Parlement, arbitres ordinaires dans les conflits commerciaux. Ainsi l'on vit en 1674 une simple lingère suivant-la-cour faire emprisonner par le prévôt de France un grand-garde des marchands merciers, grossiers et joaillers pour une simple affaire de procédure : et ce personnage était doyen des quartiniers, ancien consul, ancien échevin de Paris !

Mais le principal agrément de la charge, c'est l'autorisation qu'elle conférait de tenir boutique en n'importe quel lieu du royaume, droit conservé aux veuves des marchands durant le temps de leur veuvage. En conséquence leur indépendance était complète vis-à-vis des corporations correspondant au métier ou au commerce qu'ils exerçaient, l'apprentissage et le chef-d'œuvre supprimés, ou bien remplacés, comme nous le verrons, par des équivalents différents selon l'origine du privilège.

Pour nous limiter maintenant à l'étude de nos seuls apothicaires, nous allons nous demander comment se pratiquait l'inspection de leurs officines. Car depuis un temps très reculé les vendeurs de médicaments étaient, dans les grandes villes, soumis à la visite inquisitoriale des médecins de la Faculté accompagnés d'un ou deux représentants de la corporation des maîtres apothicaires.

Dès le XVI^e siècle, ceux-ci prétendirent à Paris avoir droit de visite dans les boutiques des privilégiés. En 1536 ils saisirent ainsi quelques ' fausses drogues ' chez plusieurs apothicaires-épiciers privilégiés du faubourg Saint-Marcel : le Parlement, consulté, approuva la saisie et le renouvellement des visites. En 1588, ils trouvaient chez un autre des ' flambeaux de cire sophistiqués ' : confiscation desdites chandelles, puis sentence du Châtelet attribuant la moitié de butin au roi, l'autre moitié à la corporation. Dix ans après, nouvelle saisie chez le même par les mêmes. Cette fois le privilégié se démène, on appelle au Grand Conseil, obtient le 23 décembre 1598 un arrêt qui non seulement provoquait la restitution des objets enlevés par cette prise ' injurieuse, tortionnaire et déraisonnable ', mais encore réglait comme suit les futures visites à opérer chez les bénéficiaires de privilèges : elles seront faites par deux docteurs en médecine et deux apothicaires, ' l'un desquels médecins et l'un desquels apothicaires seront de la suite de la Cour, et les deux autres de la ville de Paris '.

Cet arrêt qui paraît assez juste, semble oublié en 1631, puisque nos maîtres de la corporation sont repartis seuls en campagne et ont fait condamner par le Châtelet un délinquant à 4 livres d'amende. Malheureusement le Grand Conseil, appelé, ne leur est pas aussi favorable et retourne contre eux l'amende en la quintuplant. De plus il prononce qu'aucune visite ne sera plus faite chez les privilégiés sans l'autorisation formelle du prévôt de l'hôtel et sans l'accompagnement obligatoire d'un officier de ce prévôt. Au même moment les privilégiés concluent de véritables pactes d'alliance avec la Faculté qui était alors mal disposée pour les maîtres apothicaires : nos pharmaciens s'engagent à ne pas traiter de malades sans médecin ni délivrer de médicaments sans ordonnance. Ils souffriront quatre fois l'an une visite quasi-amicale des docteurs qui professent la pharmacie et de leurs adjoints qu'assisteront les syndics des privilégiés. En échange de leur soumission, ceux-ci sont officiellement reconnus par la Faculté, qui leur promet une aide bienveillante.

Devant ces succès de leurs ennemis, les maîtres apothicaires de Paris leur accordèrent à leur tour la trêve : ils promirent que leur syndic serait averti un jour avant la visite pour pouvoir y assister, et que les procès-verbaux, s'il y avait lieu, en seraient apportés au grand prévôt. Mais tôt après la guerre se ralluma. Il paraît que le syndic ainsi prévenu, prévenait à son tour les intéressés ses confrères, qui avaient ainsi tout le temps de se débarrasser des mauvaises drogues : étant annoncée, la visite devenait illusoire.

Cette connivence des syndics avec leurs confrères n'est sans doute pas si fréquente que l'assurent les maîtres, car en 1680, le lieutenant général de la prévôté condamne un fraudeur à 60 livres d'amende pour avoir mis en vente un sirop 'qualifié de fleurs de pescher' que les médecins ont trouvé 'entièrement défectueux, mixtionné et indigne d'entrer dans le corps humain'. Or c'est un syndic des privilégiés qui avait provoqué la saisie : on lui accorde la moitié de l'amende et on l'engage à recommencer. Il le fait et croit même pouvoir se passer de la compagnie des médecins. Nicolas de Blégny, l'auteur d'un des premiers journaux médicaux, qui est à la fois médecin ordinaire de Monsieur et apothicaire de la cour, est victime de son excès de zèle : cette fois le grand prévôt interdit aux syndics les visites sans la Faculté.

On revient donc à l'ancienne pratique, et il n'est pas rare de voir les syndics privilégiés et les 'gardes' de la corporation se quereller ou même se battre sur les lieux de leur inspection, en la présence des docteurs amusés et des huissiers qui, convoqués par l'une des parties, reçoivent aussi quelques bourrades, ce qui, écrit l'un d'eux à la fin de son constat, 'auroit causé un grand scandale'.

Mais voici que d'autres s'avisent de perquisitionner aussi chez les malheureux privilégiés. La veuve et le fils de 'l'opérateur' Contugi, qui avait obtenu de Louis XIV un brevet pour vendre son orviétan, s'autorisent de ce parchemin pour faire saisir et détruire plusieurs pots

chez divers apothicaires. Ceux-ci obtiennent réparation d'honneur et d'argent, n'ayant pas eu de peine à prouver que le précieux antidote était connu et fabriqué partout depuis plus d'un siècle.

' Les jurés huiliers, gardes en charge du coin et de l'étalon royal des mesures à huile de la ville, fauxbourgs et banlieue de Paris ' veulent aussi visiter les mêmes boutiques. Mais leur prétention est rejetée en 1764. Seuls les ' gardes de l'étalon royal des poids ', qui sont précisément les syndics des maîtres apothicaires de Paris, ont droit de vérifier deux fois par an les balances et poids des apothicaires ayant privilège. Ils reçoivent d'eux 15 sous pour cet office.

Jusqu'ici nous avons parlé des privilégiés comme d'un corps de métier homogène parce qu'ils étaient tous traités également en fait d'inspection. Mais ce serait bien mal connaître l'Ancien Régime français que de supposer de l'unité et de l'uniformité dans une institution de ce genre. En réalité, il existait, pour les pharmaciens seulement, tellement de sortes de privilèges que les contemporains eux-mêmes les ignoraient en partie et les confondaient. Voici, croyons-nous, les catégories principales.

Tout d'abord il faut bien distinguer les apothicaires ' de la cour ' des apothicaires ' suivant la cour '. Les premiers, qu'on dit également ' des maisons royales et princières ', furent attachés depuis un temps immémorial aux personnes des souverains, des reines, des princes et princesses du sang. En 1662, il y a dans la maison du roi quatre apothicaires servant par quartier, quatre aides apothicaires (dont le premier fut créé en 1633), deux apothicaires distillateurs, deux des Écuries ; — dans la maison de la Reine quatre apothicaires du corps, deux distillateurs, un de l'Écurie ; il y en a 5 en tout au service du duc d'Orléans et quatre chez le prince de Condé. De bonne heure il fallut acheter ces charges comme toutes celles de la cour : le possesseur était amplement dédommagé par l'exemption d'impôts, l'exercice qu'il faisait de la pharmacie à Paris et aussi par les émoluments qui au XVIII^e siècle montaient à deux ou trois mille livres pour les apothicaires du corps du roi et environ mille livres pour leurs aides.

Il ne suffisait pas de payer le prix de l'office : il fallait encore prouver son aptitude à le remplir sans dommage pour la santé des premiers personnages du royaume. Une déclaration de janvier 1642 établit l'obligation de l'examen, du chef d'œuvre et de l'expérience devant les médecins des maisons intéressées, conditions bien douces qui furent, nous le verrons, modifiées comme pour tous les autres privilégiés, en 1707.

Les marchands ' suivant la cour ' avaient été reconnus officiellement par Louis XII, mais aucun apothicaire ne figure parmi les marchands que son ordonnance mentionne. C'est François I^{er} qui, le 19 mars 1543, créa officiellement trois apothicaires de cet ordre : ils étaient tenus de prendre lettres du prévôt de l'hôtel, sans aucun doute moyennant finances. Il semble même que cette création ait été une pure mesure fiscale, car, si au XVIII^e siècle encore les ' suivant la cour ' accompagnent vraiment le roi dans ses déplacements, c'est plutôt, semble-t-il, pour faire escorte

et office de courtisans. Matériel et marchandises restent à Paris dans la boutique gérée par un garçon salarié. Ces privilégiés ne reçoivent aucun gage : ils conviennent n'acheter la charge que pour avoir le droit d'ouvrir boutique : ce sont des bénéficiaires, des pharmaciens *in partibus*.

Henri IV avait porté à six le nombre des 'suivant la cour'. Malgré les ordonnances qui défendaient l'accroissement de ce nombre, quelques hauts dignitaires se virent permettre ou se permirent de l'augmenter. A la fin du XVII^e siècle, la Chancellerie, la Fauconnerie, la Venerie, le Grand Conseil, et pendant un temps la Garde-Robe, avaient leurs charges d'apothicaires. Le premier médecin du roi vendait lui-même des brevets pour la province.

Les membres de la corporation parisienne ne cessaient de protester contre cette invasion : ils réclamaient déjà à grands cris ce que nous appelons aujourd'hui la limitation des officines : il y eut dans Paris jusqu'à 80 boutiques ouvertes par privilèges.

Ils obtinrent quelques suppressions et aussi, dès 1625, un arrêt, confirmé presque textuellement en 1672, réglant qu'aucun apothicaire suivant la cour ne serait reçu sans avoir au préalable été jugé suffisant par deux médecins haut placés et le plus ancien apothicaire de son espèce. Ils réclamaient aussi l'apprentissage obligatoire pour tous : mais alors, protestaient les titulaires, 'les lettres et droicts du roy, tant par édict de création qu'à l'avènement de la couronne et au mariage du roy seront inutiles et non recherchés'.

Une catégorie d'apothicaires que l'on s'étonnera de voir ici sont ceux de l'armée. Leur première charte remonte à septembre 1535 : elle a été accordée par François I^{er} à ses apothicaires de l'artillerie, qu'il autorise à ouvrir boutique en toutes villes et lieux du royaume sous condition d'être examinés, puis inspectés par deux médecins ordinaires de l'artillerie. Louis XIII leur confirma cette faveur ainsi qu'à leurs veuves en 1612 et 1622, afin de leur donner moyen de lui continuer les excellents services qu'ils avaient rendus, notamment en Béarn et Saintonge, 'où ils ont eu beaucoup plus de frais qu'ils n'en retirent de gages'. En 1688 il y a deux apothicaires-majors des camps et armées, un de la Bastille, deux de l'artillerie (dont une veuve), un des Cent-Suisses, un du régiment des Gardes, un de la Cavalerie légère. A d'autres moments il y en eut aussi pour la marine, pour les hôpitaux, pour les mousquetaires.

Un autre clan de privilégiés qui celui-là échappe non seulement à l'autorité de la corporation, mais encore à celle du roi, est celle des artisans de certains faubourgs dont la censive appartient à des abbayes dotées très anciennement de haute, moyenne et basse justice : ainsi le faubourg Saint-Marcel qui appartenait à l'abbaye de Sainte-Geneviève. Une longue enquête sur la légitimité de tous les 'affranchissements de maîtrise' de ce genre, menée au début du XVIII^e siècle, conduit à pas mal de suppressions.

Le dernier ordre des privilégiés que nous envisagerons est celui des anciens apothicaires des hôpitaux. L'Hôtel-Dieu, les Incurables, la

Salpêtrière (ce dernier en 1656 au moment de sa création), avaient reçu la faculté de posséder des chirurgiens et apothicaires 'gagnant maîtrise' ; en d'autres termes, les apprentis en chirurgie ou pharmacie qui serviraient dans ces hôpitaux pendant six ans auraient le droit au bout de ce temps de s'établir pour leur compte : c'était une façon économique de payer leurs services. On discuta longuement sur la question de savoir si le fait de gagner maîtrise impliquait pour les maîtres apothicaires l'obligation de les recevoir sans frais ni examen dans leur communauté ou simplement de tolérer l'ouverture de leurs boutiques. Le temps nous manquerait pour passer en revue la série d'arrêts destructifs les uns des autres qui furent rendus au cours de cette 'crise de l'internat' au XVII^e siècle.

Pour terminer cette question de l'apprentissage, nous ne citerons qu'une loi importante entre toutes, car elle fixe en bloc les conditions de réception pour les chirurgiens et apothicaires privilégiés de toutes les catégories : c'est l'article 38 de l'édit de mars 1707 : 'Nul ne pourra, dit-il, à l'avenir être pourvu desdites charges . . . s'il n'a été reçu maître dans quelque une des villes de notre royaume, ou si n'étant pas maître, il ne rapporte pas des certificats de dix années de services dans les hôpitaux de nos armées ou dans l'Hôtel-Dieu de Paris, ou des autres villes de notre royaume dans lesquelles il y a Parlement ou baillage royal, sans préjudice de l'examen qu'il sera obligé de subir en la manière accoutumée devant notre premier médecin ou autre par lui commis.' — Précautions encore incomplètes, car les ignorants trouvaient le moyen d'acheter un brevet de maîtrise, après un examen dérisoire à Pontoise.

Il faut ajouter au tableau un dernier trait : ce ne sera pas le moins pittoresque. Ces privilégiés qui avaient sans cesse à souffrir de l'esprit jaloux d'une caste étroitement unie et fermée, la corporation, ces privilégiés qui semblaient devoir être les champions de l'indépendance, s'enchaînèrent de bonne heure les uns aux autres en formant non pas une, mais deux communautés ou confréries.

La première en date est celle des suivant-la-cour, qui remonte au 10 juillet 1633. Elle avait élu pour patron Saint-Nicolas d'hiver, en l'honneur duquel elle faisait dire tous les ans une messe dans la chapelle Saint-Nicolas de l'église Saint-Germain l'Auxerrois. Tous les deux ans les confrères devaient choisir l'un d'entre eux comme syndic. Ils s'obligeaient à n'admettre aucun nouveau membre sans lui avoir demandé des preuves de sa capacité et une aumône de 60 livres pour la bourse commune, enfin à ne prendre aucun apprenti sans l'avoir interrogé et jugé 'congru en langue latine'.

Les apothicaires des maisons royales et princières suivirent cet exemple le 2 juin 1642. Ils prirent même patron, mais convinrent de l'honorer dans la chapelle du Louvre. Les statuts étaient analogues.

Le plus piquant, c'est qu'en 1693, un ancien syndic de cette dernière communauté, Henri Rouvière, qui exerçait à la cour en vertu de trois privilèges simultanés, s'étant brouillé avec ses pareils, ne se contenta pas de quitter leur confrérie, mais alla demander asile aux maîtres de

la Corporation parisienne qui l'accueillirent avec enthousiasme. Fureur des titulaires, qui voulaient l'obliger ou à ne pas quitter leur communauté, ou à vendre ses privilèges. Le lieutenant général de police, puis le Conseil privé estimèrent cependant que charge et communauté étaient deux institutions indépendantes et ils approuvèrent le transfuge.

Dans l'édit qu'il faisait signer au roi en février 1776 et par lequel il entendait supprimer toutes les communautés d'arts et métiers, Turgot se réservait de statuer spécialement sur celle des apothicaires. En effet, la déclaration du 25 avril 1777 apporta les premiers éclaircissements sur son sort. Elle décidait la réunion des maîtres apothicaires de Paris et de 'ceux qui sous le titre de privilégiés exercent la pharmacie dans ladite ville et faubourgs d'icelle', 'pour ne former à l'avenir qu'une seule et même corporation sous la dénomination de Collège de Pharmacie'. C'était la suppression des communautés des privilégiés, mais sans la suppression de leurs charges.

Tout de suite les privilégiés s'élevèrent contre cette union forcée : 'Que produira, s'écrièrent-ils, cette alliance de deux corps naturellement opposés ? Une guerre toujours subsistante.' Ils n'étaient plus qu'une quinzaine (leur nombre avait bien décréu) contre environ 130 maîtres : certainement leurs voix ne pourraient lutter dans les assemblées contre celles de leurs adversaires. C'est ce qui arriva : les statuts définitifs du Collège votés malgré eux le 28 juillet 1779 établissaient que sur les quatre prévôts ou adjoints à élire, un seul serait choisi parmi les 'titulaires'. Les aspirants à une charge de la cour devraient payer dorénavant un droit de 1200 livres en faveur du Collège. Enfin, outre la visite annuelle de la Faculté chez tous les apothicaires, les prévôts en charge devraient en effectuer deux autres, taxées à 6 livres, et encore autant d'autres qu'ils jugeraient bon de faire sans frais : 'Pour le coup, il vaut autant que les apothicaires de la cour (ce sont eux qui gémissent ainsi) plient bagage et s'en aillent chercher la liberté parmi les nations étrangères.'

Ces récriminations étaient exagérées : les titulaires ne pouvaient prétendre à l'égalité dans un corps dont ils formaient seulement le dixième. L'essai d'unification de Turgot était fort louable : seulement c'était là une demi-mesure : pour être logique, il eût fallu supprimer non seulement les confréries de privilégiés, mais encore et surtout les privilèges eux-mêmes. La Révolution seule pouvait le tenter : elle surprit nos ennemis en pleine lutte et les mit d'accord par cette seule suppression. Ainsi le Collège put continuer à vivre, à peine modifié, sous le nom d'École gratuite de Pharmacie.

[Tuesday Morning, August 12]

SECTION XXIII HISTORY OF MEDICINE

INDEPENDENT PAPER

A NEW GUY DE CHAULIAC MS.

By J. A. NIXON, M.D., F.R.C.P.

GUY DE CHAULIAC, whose book on surgery exercised so great an influence in Europe for several hundred years after his death, was born shortly before A.D. 1300 in the village of Chaulhac in Auvergne.

Very little information exists as to his early life. He studied at Montpellier and had for his master Raymond de Molières, who was Chancellor of the University in 1334. Afterwards he became the pupil of Bertrucci at Bologna, and later made his way to the University of Paris.

For many years he practised medicine at Lyon, and was finally physician to the Popes, Clement VI, Innocent VI, and Urban V at Avignon. Guy de Chauliac was a cleric and held a canonry and prebend at Rheims; he died in July, 1368.

The work by which he is known to us is called the *Cirurgia Magna*, and it remained for a long while the standard work in Europe on the art of surgery. The book is more than a mere treatise on the practice of surgery; it contains all the scientific knowledge which the author considered should belong to the chirurgical part of medicine. It was, as he calls it, a 'Collectorium' or compilation from almost every previous author.

The work contains a complete treatise on anatomy and chapters on materia medica and therapeutics, in addition to the purely surgical portions, as we should now regard them.

Besides the *Cirurgia Magna*, Guy de Chauliac is supposed to have been the author of three lesser treatises, all of which are believed to be lost: *De astrologia*, *De subtilianti dieta* (a regimen for cataract, written for John, King of Bohemia), *De ruptura*. Nicaise describes the following known MSS. of the *Cirurgia Magna*:

Latin MSS., 22 in number; Provençale, 2; French, 4; English, 3; Italian, 1; Hebrew, 1; Dutch, 1; also 7 fragments in MS.; 4 commentaries; 5 abridged versions; 6 of the so-called *Cirurgia Parva*.

In the magnificent edition of Guy de Chauliac's *Cirurgia Magna* published in 1890 by Professor Nicaise, the bibliography of MSS. and printed

editions of the works of this founder of didactic surgery appeared to be complete and exhaustive. So that when Nicaise mentioned a treatise on astrology as having been written by Guy de Chauliac, he regretfully added, 'ce que Guy a écrit sur ce sujet est perdu, il n'en existe ni ms. ni imprimé.'

Nevertheless, one early Latin MS. of the *Cirurgia Magna* had escaped the careful inquiries of Nicaise.

In 1615 Tobias Mathew, Archbishop of York, presented to Bristol, his native city, a portion of his books and manuscripts. A public library, one of the oldest in England, had been founded in 1614 by Robert Redwood, who gave his lodge to be converted into a suitable building for the purpose of a library. Dr. Tobias Mathew at about the same time supported Redwood's efforts with a gift of rare manuscripts and incunabula, stipulating that they should be preserved 'for the free use of the merchants and shopkeepers of the city'.

The 'Mathew Bequest' has survived the stormy years of the Civil War, when Bristol was more than once besieged; it has also survived the indifference and carelessness of the eighteenth century, when one of the Bristol chroniclers summed up the rich treasures of the Free Library in a sentence which doubtless represents the opinions of the time, 'There are a few MSS. but they contain nothing of interest or curiosity.'

Among the treasures thus lightly dismissed there exists a fifteenth-century MS. on paper bearing the earliest Bordeaux water-mark. The chief part of this MS. consists of the *Cirurgia Magna* of Guy de Chauliac, complete, intact, almost unsoiled, beautifully written, and carefully corrected with contemporary marginal glosses where the copyist's rendering is incorrect or his caligraphy doubtful.

The volume opens with a short treatise on 'The use of the astrolabe' (*de practica astrolabii*) which occupies five double pages. This begins 'Practica astrolabii. De nominibus instrumentorum astrolabii', and deals with the mechanism of the astrolabe and the art of locating the stars and planets.

After this ten double pages are left blank.

Then comes the *Cirurgia Magna* in full, the first page being headed by two illustrations in grey-brown ink; one representing a monk handing a scroll to a nobleman surrounded by his retinue, the other, the monk working at his desk writing the scroll.

The writing begins in red ink:

In dei nomine incipit inventarium seu collectarium in parte chirurgicali medicinæ compilatum et completum anno Domini Millesimo tricentesimo sexagesimo tercio per Guidonem de Caulhiaco Chirurgicum Magistrum in medicina in preclaro studio Montispessulani. Quodquid inventarium seu collectarium fecit scribi et taliter ordinari venerabilis vir magister Iohannes Tourtier Magister in Chirurgia ad requestam altissimi excellentissimique et potentis principis Domini Iohannis ducis de Bedford Regentis regni Francie et Protectoris regni Anglie:



FIG. 1.

After this follows in black the usual prologue: 'Postquam primo gratias egero omnipotenti.'

The seven books, each prefaced by a short description of its contents, then follow without omission or flaw. At the beginning of each book are



FIG. 2.

miniatures representing various surgical or anatomical subjects different from those reproduced in Nicaise's edition of 1890, the costumes being of an earlier date.

It is believed that the monk with the scroll in the first miniature represents Johannes Tourtier, and that the nobleman receiving the scroll is John, Duke of Bedford. At the end of the seventh book the following colophon

is appended: 'Explicit liber peroptimus de chirurgiae ditus a Guidone de Caulhiaco magistro in medicina et chirugia.' This colophon is interesting from the fact that, according to Nicaise, it only occurs in this form in one other MS., namely, that in the British Museum (Sloane, 967), where 'doctore' is inserted after 'chirugia'.

The Bristol MS. dates from between the year 1420, when the Duke of Bedford became regent of France, and the year of his death, 1435.

The distinguishing feature, however, of the Bristol MS. lies in a short treatise which continues after the colophon. Immediately and without any break in the writing, without even beginning a fresh column, there follows a treatise on astrology, commencing thus: 'Circa istam materiam est intelligendum pro natura dierum creticorum.' The first part of this treatise lays down certain general considerations of the influence of the planets, constellations, and stars. Diseases are said to be of two kinds, chronic and acute. Those of a chronic nature are ruled by the movements of the sun, those of an acute nature by the movements of the moon. There are many references to the 'Wise Egyptians' as the source of astrological knowledge.

The next section deals with the twelve constellations or signs of the Zodiac. They are described in order and their qualities and properties catalogued according to a definite plan, thus:

'Primum Signum Zodiaci est Aries a quo incipiunt omnes operationes, et est calidæ et siccæ condicionis et est signum mobile, masculinum. Cuius oppositum est Libra et habet aspectum ad totum caput et collum.' 'Secundum Signum est Taurus frigidæ et siccæ condicionis et est Signum stabile femininum tamen cuius oppositum Scorpio et habet aspectum ad collum et ad spatulas,' and so on through the twelve signs of the Zodiac, each governing some particular portion of the body.

This section closes with the sentence 'et est intelligendum quod quodlibet signum habet triginta gradus et ita in toto Zodiaco sunt 360 gradus'.

Next the planets are described: 'Planetæ autem erraticæ sunt septem. Primus est Saturnus Vitæ contrarius malevolus frigidæ et siccæ condicionis tardi motus qui habet aspectum ad Viros magistros,' &c.

Each planet is situated alternately in one of two constellations, according to seasonal variation. These constellations are known respectively as the 'first' and 'second' house of the planet. Thus the 'first house' of Saturn is *capricornus*, the second *aquarius*. The malevolent disposition of Saturn is modified according to the 'house' occupied.

The planets not only affect throughout life such persons as come by nativity under their influence, but they also govern the success of certain treatments such as phlebotomy, or the prognosis of certain diseases or injuries. It is said for example of the Moon:

'Si quis Vulneratus fuit in collo luna existente in Tauro periculosus erit morbus.'

The wind is the subject of a short description which begins 'Ventus est Vapor siccus ab inferioribus resolutus ad superioribus ascendens'.

The fixed stars such as Pleiades possess certain powers, while the properties of drink, sleep, and moderate coitus are also mentioned.

Lastly, four chapters are devoted to the prognostication of diseases in the four seasons, spring, summer, autumn, and winter; and the efficacy of remedies appropriate to the seasons.

The treatise occupies seven double pages, and closes abruptly after mentioning the value of many plants 'et sic de aliis, et sic prognoscabitur. Si deus Voluerit explicit'.

There is nothing to indicate that this 'Astrologia' is by another author than Guy de Chauliac. This is undoubtedly not an example of the common practice of binding several MS. treatises together, for the reason that the writing is continuous from the end of the *Cirurgia Magna*.

There is another treatise included in this MS. which comes after the 'Astrologia' and is separated from it by several blank pages. This is the 'Centilogium of Tholomeus' as shown by its opening phrase, 'Via seu sententia tholomei in suo centilogio'.

An exceedingly interesting Latin-English glossary in the same handwriting as that of the 'Practica astrolabii' completes the volume.

The whole MS. seems to originate from the time when John, Duke of Bedford, was fighting the battles of the English in France after the death of Henry V. It was in these wars that Joan of Arc successfully resisted the English arms, and it was from these wars that the organization of military surgery gave so great an impetus to the profession of surgery in England.

It seems probable that the Duke of Bedford, at the instance of his principal surgeons, Thomas Morstede and Nicholas Colnet, ordered this copy of Guy de Chauliac's *Cirurgia Magna* to be made for the benefit of the surgeons of his army. But of the subsequent history of this MS. until it came into the possession of Tobias Mathew, Archbishop of York, some two hundred years later, nothing is known.

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[NOTE.—For the loan of the blocks, the Author is indebted to the City Librarian, Bristol.]

[Tuesday Afternoon, August 12]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

ILLUSTRATIONS OF INFORMATION FURNISHED
BY MEDALS, SMALL BRONZES, &c.

By F. PARKES WEBER, M.D., F.R.C.P., F.S.A.

I BELIEVE that apart from the portrait medals of physicians, surgeons, scientists, &c., the medical interest in numismatics has been overestimated. An appeal to coins and medals, however, frequently confirms or illustrates some already known or surmised detail. Occasionally coins and medals and other old metallic 'documents' furnish the only evidence forthcoming in regard to some point of interest. I have ventured to bring before you to-day a few examples illustrating the kind of, and sometimes scantiness of, information on various subjects to be derived from an appeal to medals, small bronzes, &c.

Baron de Witte, in the *Mémoires de la Soc. des Antiquaires de France* for 1869 (vol. xxxi, p. 168), referred to a small votive bronze figure found near Soissons, in the Department Aisne, France. It represented an emaciated man seated on a stool, and bore the dedicatory inscription : ΕΥΔΑΜΙΔΑΣ ΠΕΡΔΙΚ(ΟΥ ΑΝΕΘΗΚΕ) ; and had been already figured by A. de Longpérier in the *Revue Archéologique* for 1844 (Paris, First Series, vol. i, Plate XIII). It was evidently a votive offering dedicated by the man whose name is inscribed on it, who must have been afflicted by some wasting disease. The existence of such a figure, to my mind, undoubtedly throws light on a curious passage in the *Description of Greece* (Book X, on Phocis, chap. ii. 4) by Pausanias, in the second century A.D., but I find that Baron de Witte in his communication above referred to already recognized and specially drew attention to this.

I will quote the passage from J. G. Frazer's translation of Pausanias's work (London, 1898, vol. i, p. 501) : ' Scarcely, it is said, had he (Phaylus) entered on the command when he saw a vision in a dream, and it was this. Amongst Apollo's votive offerings (at Delphi) was a bronze effigy of a mouldering corpse, the flesh all wasted away, nothing left but the bones. It was said by the Delphians to be an offering of Hippocrates, the physician. Now in his dream Phaylus thought that he resembled this effigy ; and immediately he was attacked by a wasting sickness that fulfilled the

augury of the dream.' There can scarcely be a doubt that the bronze figure referred to represented a man wasted by disease almost to a skeleton, and was a votive or thank offering (*ἀνάθημα* or *donarium*) dedicated by the sick man after or in hopes of recovery.

Another illustration that I have chosen relates to Dr. Wenzel Beyer or Payer or Bayer (1488-1526), the author of the first medical treatise on the thermal waters of Karlsbad in Bohemia. By being practically the first to recommend patients to take the waters internally he must have enormously increased their utility. In his book above referred to, *Tractatus de thermis Caroli IV*, &c., Leipzig, 1521, he wrote: 'I have said that this water must be drunk. As, however, till now it has seldom been used for drinking, but more for bathing, what I have said will appear to many as something new.' Beyer was born at Elbogen near Karlsbad, as appears from the title-page of his book, where his name is given as Venceslaus Payer *de Cubito*, that is to say, of Elbogen. Not much more would be known or surmised about Beyer were it not for the existence of two medals commemorating his death in 1526, examples of both of which exist in the Imperial Collection at Vienna. I will shortly describe them.

Like most German portrait medals of the time they are doubtless the work of some goldsmith and are both cast and chased in silver. The first one (diameter 2.2 inches) bears on the obverse the portrait of Beyer, in profile to left, at the age of 38 years, with the inscription: WENCES BEYER, &c. On the reverse, in a bare landscape (with one tree), is a steaming chasm, into which a horseman (Marcus Curtius?) is about to plunge. In the foreground is a book, and upon that rests a skull; there are loose bones lying about; and in some specimens the date, 1526, occurs in the field. The inscription is: IAM PORTVM INVENI, SPES ET FORTVNA, VALETE. (See Fig. 1.) The more usual quotation is:

'Inveni portum; Spes et Fortuna valet!
Sat me lusistis, ludite nunc alios.'

that is to say, 'I have found the haven; Hope and Fortune, farewell! You have made sport enough of me, now make sport of others.' It is said to be the translation of a Greek epitaph, ascribed to Janus Pannonius, also to Prudentius (see W. Gurney Benham, in his *Cassell's Book of Quotations*, p. 568). The reverse type certainly suggests a reference to Marcus Curtius, the Roman legendary hero, who, when he heard that the chasm in the Forum could only be filled by throwing Rome's greatest treasure into it, mounted his horse and leaped into the abyss, declaring that Rome possessed no greater treasure than a brave and gallant citizen.

The second medal (diameter, 2 inches) bears Beyer's bust on the obverse, with a similar inscription to that on the obverse of the first medal, but the portrait is nearly a full-face one. The reverse represents a bier, standing on stony ground, with a decaying corpse stretched at full length upon it. Above this is the inscription in four lines: CVM PARITER OMNIBVS MORIENDVM NON TARDE SED CLARE MORI OPTANDVM. ('Since all

alike must die, it is desirable to die not tardily but illustriously.') On the field of the reverse is the date 1526.

Nothing seems to be known with certainty as to the cause of Beyer's death, but the reverse designs on these two medals, especially that referring to the legend of Marcus Curtius, suggest that his death was the result of (or, at the time, supposed to be the result of) an injury or disease acquired when examining the source of the great hot spring ('Sprudel') at Karlsbad. At the present day, close to the Sprudel, along the sides of the river Tepl, clouds of steam arise from the ground itself. The rocky ground on which the bier stands (in the second medal) probably represents

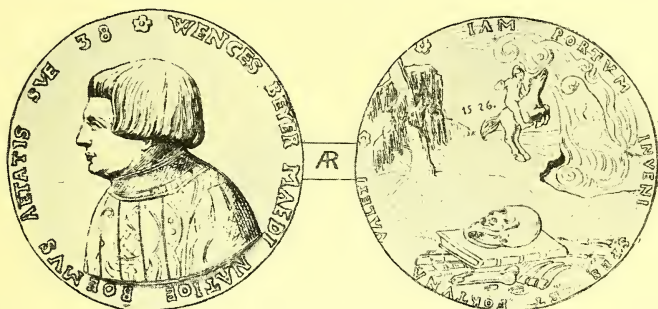


FIG. 1.

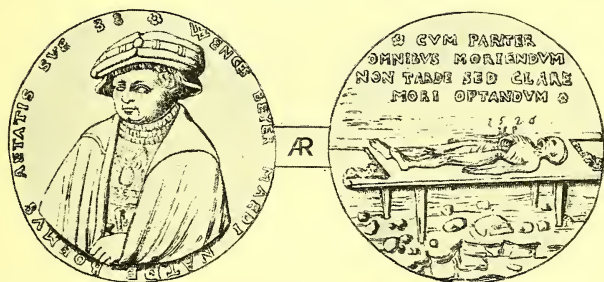


FIG. 2.

the bed of the Tepl, and the book (on the first medal) is probably an allusion to Beyer's book on the Karlsbad springs. Beyer's patron, Count Stephan Schlick, to whom he dedicated the treatise in question, was hereditary Lord of Elbogen, and doubtless owned Karlsbad itself. Therefore, Beyer's book, by increasing the use of the thermal waters, was probably of some financial service to the Schlick family, who apparently had these commemorative medals made. They are, as already stated, made in the ordinary manner of the period, that is to say, cast and chased, probably the work of some goldsmith patronized by the Schlick family. Count Stephan Schlick himself was one of those who perished with their sovereign, King Louis II of Hungary (and Bohemia), in the disastrous battle against the Turks (under Soliman II) at Mohacs on August 29, 1526. It was by this Count Stephan Schlick and his brothers that the large silver

coins were issued at Joachimsthal, called *Joachimsthaler*, from which the words *thaler* and *daler* and *dollar* are derived.

The correct explanation of the types on these medals is chiefly due to J. de Carro, who wrote an account of them in a Karlsbad almanac published at Prague in 1841 (to which my attention was kindly drawn by Dr. Paul Mayer)—and, I believe, in an earlier work, in the French language, on the Karlsbad waters—and to Joseph Bergmann, who described them at length in his work, *Medaillen auf berühmte und ausgezeichnete Männer¹ des Oesterreichischen Kaiserstaates*, published at Vienna in 1844. Bergmann, in this connexion, aptly quotes Ovid (*Fast. Lib. iv.*, 709), ‘Factum abiit ; monumenta manent.’

Philetærus, the founder of the kingdom of Pergamus, was a eunuch, and one might ask whether his portrait on coins resembles that of a eunuch.



FIG. 3.

His portrait, sometimes in a magnificent style of medallic art (as on the tetradrachm illustrated), appears on the coins of his nephew and successor, Eumenes I (B.C. 263–241), and certainly does fairly well accord with the supposition that he was a eunuch (see Fig. 3, for which I am indebted to the kindness of Mr. G. F. Hill). It must be admitted, however, that neither this paragraph nor my next one belongs, strictly speaking, to the subject of medicine.

The Byzantine Emperor, Constantine IV (668–85), surnamed ‘Pogonatus’ on account of the enormous growth of his beard during a military expedition, is never represented on coins with an extraordinarily large beard. On the other hand, on some (common) gold coins, the portrait of his father, the Emperor Constans II (641–68), has the largest beard and moustaches, I believe, that have ever been represented on coins or medals. Therefore, though ‘Pogonatus’ is not himself conspicuous for his beard

¹ This title reminds me of a remark by the great surgeon, Billroth, in regard to collections of medals of ‘famous’ and distinguished physicians and naturalists: that the medals in such collections were chiefly, not of distinguished and well-known, but of forgotten, obscure, or absolutely unknown, physicians and naturalists.

on his coin-portraits, the coin-portraits of his father suggest a family potentiality to the growth of enormous beards and moustaches.

Some of the gold coins of Samudragupta, the Indian king who reigned A.D. 337 to 380, represent on one side the king standing, holding the axe of Kritanta (that is to say, the 'End-maker' or Death). This 'battle-axe type' of coins was meant to signify that the king in question was as great a conqueror as Death himself, for the surrounding inscription means: 'Wielding the axe of Kritanta, he conquers even invincible kings.' There are other coins commemorating Samudragupta's successes in the arts of war and peace, his wonderful conquering campaigns and his musical attainments. One would think that such a man must have suffered from a kind of 'megalomania', but his conquests were real, and he had a long and prosperous reign. This brings one to the whole hitherto unexplored subject of indications of mental abnormality or peculiarity furnished by coins, medals, &c. In this regard W. W. Ireland (*The Blot upon the Brain*, 2nd edit., p. 116, Edinburgh, 1893) referred, for an example, to the forced currency of Muhammad ibn Taghlak, Sultan of Delhi (A.D. 1324-51), but the idea of such a *token currency* seems to have been a perfectly sane one (cf. Stanley Lane-Poole, *The Coins of the Sultans of Delhi in the British Museum*, 1884, introduction, p. xxi).

The following 'memento mori' medal of Virgil, though not in any way strictly medical, may be mentioned here as recalling the remarkable tradition of Virgil's magical powers, &c., in the middle ages. The obverse bears a profile bust of Virgil to left, in mediæval dress, wearing barette, between the letters P (for Poeta) and O (for Orator); below this is the name VIRGILIUS; the whole is within an ornamental circle. Outside this circle is the inscription in Gothic letters:

' Mantua me genuit, Calabri rapuere, tenet nunc
Parthenope. Cecini pascua, rura, duces.'

Following this inscription is the fanciful date 1132 (= 1134). (See Fig. 4.)

The reverse represents the head and neck (skull, spinal column, collar-bones) of a skeleton facing, in an ornamental circle. The skull is being 'eaten by worms', and has a thighbone between its jaws; remnants of neck muscles are indicated. Inscription in Gothic letters: 'Quod sumus, hoc eritis, fuimus quandoque quod estis.' (See Fig. 5.)

A fine specimen from the Bernal collection, in silver gilt (diameter, 2.6 inches), cast and chased, is in the Victoria and Albert Museum, London (from this specimen my illustrations were obtained), and another specimen has been described in *L'Arte* (Rome, 1907, vol. x, p. 449, and 1908, vol. xi, p. 56).

The whole type of this medal must refer to Virgil's reputed tomb at Naples, over which (according to Donatus's account) was engraved the inscription, 'Mantua me genuit,' &c. In mediæval times and later this tomb constituted one of the greatest sights for visitors to Naples. The date (1134) on the medal probably refers to the alleged original

discovery by an Englishman (as narrated by Gervase of Tilbury in his *Otia Imperialia*) of the poet's bones, inside a mountain, in the reign of Roger of Sicily (*vide* Domenico Comparetti, *Virgil in the Middle Ages*,



FIG. 4.



FIG. 5.

English translation by E. F. M. Benecke, London, 1895, p. 273). I am indebted to Mr. G. F. Hill for information on the subject. On the whole question of the tomb of Virgil see also R. T. Günther, *Pausilypon, &c.* (Oxford University Press, 1913).

An earlier date than the fifteenth century can hardly be admitted for

this medal, which appears to be the work of a good goldsmith, but a poor artist. It was perhaps made to be 'planted' at Naples and sold as a valuable, if not magical, relic to rich and credulous, though possibly lettered, travellers of the period. The whole idea of the medal is analogous to that of the so-called *gisant* class of sepulchral monuments, which did not come into existence before the fifteenth century (a good example in England is the tomb in Canterbury Cathedral of Archbishop Chichele, who died in 1443). Cf. F. P. Weber, *Aspects of Death in Art and Epigram*, second edition, London, 1914.

In conclusion I wish to show five small bronze Greek coins (kindly lent me from my father's collection) of the island of Cos, of the first and second centuries A.D. One of them, probably of the first century, has the bust of Hippocrates on the obverse; another, of about the same period, or slightly later, has the head of Heracles on the obverse and a figure of Hippocrates seated on the reverse. The other three have a portrait of the physician, Xenophon, on the obverse; one (probably of the first century), with the legend $\Xi\epsilon\nu\phi\omega\nu\ \iota\epsilon\rho\epsilon\upsilon\varsigma$, shows that Xenophon was also an Asclépiā priest; two are of rather later style, probably of the second century, and bear the physician's name on the portrait side without the title $\iota\epsilon\rho\epsilon\upsilon\varsigma$. Not much is known of this Xenophon, but according to the notice in Smith's *Dictionary of Greek and Roman Biography*, he was a native of Cos, a descendant of the family of the Asclepiadæ, and a physician to the Emperor Claudius. Xenophon obtained from Claudius certain privileges for his native island. 'He was afterwards induced by Agrippina to murder the Emperor by means of a poisoned feather, which he introduced into his mouth under the pretence of making him vomit, A.D. 54.' Such a statement should obviously not be accepted without great hesitation, if, indeed, it can be accepted at all.

[Tuesday Afternoon, August 12]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

TERRA SIGILLATA, A FAMOUS MEDICAMENT OF
ANCIENT TIMES

By C. J. S. THOMPSON

AMONG the medicaments famous in ancient times, but now almost forgotten, Terra Sigillata, or the sacred Sealed Earth from the Island of Lemnos, held an important place. It is especially interesting as it forms a direct link with Greek medicine, and survived until the middle of the nineteenth century. From about 100 B.C. until the end of the eighteenth century it enjoyed a great reputation, and was renowned throughout Europe for its remarkable properties. There is no record of its discoverer, but that it was in use in medicine before the time of Dioscorides, 40 B.C., is evident from the allusion to it in his work on *Materia Medica*. 'Lemnian earth,' he states, 'is found in certain caves of the Island of Lemnos in some marshy land. The best quality is here selected and then mixed with goats' blood. The inhabitants of the Island of Lemnos make the earth into lozenges, which they seal with the impression of a goat and call them goats' seals (Fig. 1). It is an antidote against deadly poisons. If it be taken before the poison, it promotes vomiting and expels it. Against stings and bites of all poisonous animals it is also efficacious, and is beneficial in the treatment of dysentery.'



FIG. 1.

Pliny alludes to this medicament about A.D. 100, and remarks on the high esteem in which it was held. He says, 'It comes after cinnabar in importance. Both the earth and the island on which it is found were well known in antiquity. As a medicine it is much esteemed. If rubbed under the eyes it moderates pain and watering from the same, and prevents the flow from the lachrymal ducts. In cases of hæmorrhage it should

be administered in vinegar. It is used against complaints of the spleen and kidneys, copious menstruation, also against poisons, and wounds caused by serpents.'

Galen, A.D. 131-201, appears to have been greatly interested in this medicament and its mysterious origin, and records in his work on the *Virtues of Simples* that he visited the Isle of Lemnos on two occasions in order to discover the true Lemnian earth, and to learn how it was prepared on the spot. From what he states, even in those early days, Terra Sigillata had achieved a wide reputation and a high commercial value, and attempts were made to substitute for it other earths that were similar in appearance. In his time the Greeks stamped or sealed the earth with a representation of Diana, one of the goddesses associated with healing, and the seal was regarded as sacred. He describes the true Lemnian earth as that which does not stain the hands when touched, as 'rubrica.' 'This earth,' he states, 'comes from Lemnos, the island otherwise called Stalimene, and is found close to a town called Hephestias on the top of a red-stained hill, barren of plants and which has the appearance of having been burnt. Three kinds of it are used—the first, that which is called sacred and which nobody but the priestess may touch; the second, that which might really be called "rubrica" and which is often used by smiths and carpenters; and the third, which has cleansing properties and is used in removing stains from clothes and linen. Having read in Dioscorides and other authors that Lemnian earth was mixed with goats' blood, and that out of the mass that resulted the priestess formed the lozenges called Lemnii, I now ardently desired to see how the earth was mixed and to know the properties of the parts. I was pleased to sail to Lemnos and see the quantity of blood used in that earth. The hill from which the earth is taken has a burnt appearance, not only in colour but also because nothing whatever grows upon it. It was on this hill that during my stay a priestess came one day, and, having spread some barley and corn upon the ground, and having carried out a few other ceremonies customary in that country, she loaded a cart full of that earth. She carried it into the town and began preparing in the open air those well-famed Lemnian seals.' The earth was first treated with water, stirred, and then allowed to settle to free it from impurities. The supernatant liquid was then decanted, and the earth deposited was removed, freed from stones, and dried into a soft mass which was afterwards cut into tablets and stamped with the sacred seal of Diana. The priestess then placed the tablets in the shade, where they were allowed to remain until all moisture had evaporated and they had become hard and dry.

'I thought it right,' continues Galen, 'to inquire whether anyone recollected that earth ever being mixed with goats' blood. But this question was received with derision. I was given a book written in ancient times by one of that country, in which all the virtues and uses of the Lemnian earth are given. I was pleased to experiment with them

and took away with me 20,000 of these seals. The person who gave me the book, and who was one of the most important men of the island, used the medicament for many purposes, such as old ulcers which were slow in healing, and against bites of snakes and other animals. He advised me to administer the earth after and not before poisons. He stated that he had experimented with Terra Sigillata mixed with juniper as an emetic. I have used this in cases where people have been suspected of having eaten cantharides and sea hare, and as soon as they had taken the potion composed of Lemnian earth they vomited everything, so that they escaped the consequences of these poisons although they had eaten of both. I do not know whether the potion made of juniper and Terra Sigillata has the same effects against deadly poisons, but that Hephestian affirmed it for a certainty, so much so that he said it cured those bitten by mad dogs, if taken with watered wine, and if applied externally to the wounded part with some very strong vinegar. He used it also for bites of all kinds of animals, and applied it to the affected part on a leaf, which has the faculty of resisting putrefaction. We have tried it with success for malignant ulcers and plagues hard to cure. Thus when the ulcers are soft the Lemnian earth must be mixed with very strong vinegar and then applied.'

Galen describes the difference between Lemnian earth and Armenian bole, and, referring to the latter, states: 'During the spread of a very severe and cruel plague some earth of very cleansing properties was brought to me. It came from Armenia, and was called by the person who gave it me *stone*, and not earth. It crumbles up as lime does, and, like the latter, contains no sand.'

In the Syriac Book of Medicines, recently translated by Dr. Budge, which was probably written about the twelfth century, Terra Sigillata is included as an ingredient in several of the recipes.

Bartholomæus Anglicus, in a MS. written in the thirteenth century, refers to 'A serten veyne of the erthe called Terra Sigillata, which is singularly cold and drie. And Dioscorides calleth it Terra Saracenica and argentea, and is somedeale white, well smellynge and clere. The chief virtue thereof byndeth and stauncheth. And powder thereof tempred with the whyte of an egge stauncheth bledynge at the nose. And helpeth ayenst swellinge of the fete and ayenst the gowte, if it be layed in a playstre thereto, as it is sayde in Lapidario.'

So great was the demand for the famous Terra Sigillata of Lemnos from the thirteenth to the fourteenth century that many other earths, for which similar properties were claimed, were exploited and recommended in many of the books on medicine of that period. Almost every country in Europe strove to find within its boundaries a source of supply of so valuable and profitable a commodity. Some of these rival medicaments acquired a considerable reputation, one of the most celebrated being Terra Sigillata Strigoniensis, or Strigian earth, which was found in Silesia and for which remarkable properties were claimed.

It was yellow in colour, and when made into tablets was impressed with a seal representing three mountains (Fig. 2). It was also known as *Axungia Solis*, as it was supposed to contain particles of gold, being obtained from a pit in a disused gold mine. The properties of Strigian earth are described in a curious little work by Johannes Montanus, printed in 1585, in which



FIG 2.

he records various tests which were made of its powers first on animals, and afterwards on a man who had been made to swallow a considerable quantity of corrosive sublimate. The account of the latter test is so interesting that it is perhaps worth quoting in detail. It reads as follows in the quaint language of the time :—

‘ We Wolfgangus Earle of Hohenloe, Lorde of Langenburg, &c. Do openlie make knowen unto all men by these my Letters Testimoniall, that there came lately before me at Langenburg, my welbeloved friende Andreas Betholdus of Oschatz, and declared unto mee that he had a most excellent kinde of Terra Sigillata, which was not alonely of great force against sundrie diseases : but also a most undoubted remedy against all manner of venemous poisons, as had beene prooved by sundrie witnesses upon a great number of dogges, which made me also desirous to see the triall of it. It happened at the same time, that one called Wendel Thumblardt was by our Lieuetenant of Langenburg for certaine felonies imprisoned, who being examined by our Justices, confessed himself guilty of a great number of robberies : And therefore brought to the barre was condemned to bee hanged. Being yet detained in prison, and coming to his eare that there was such a medicine, so soveraigne against sundrie sicknesses, and the most deadly poisons, has made humble request as well by his parents, as by other his friends, of which there were present no small number, desiring for the mercie of God, and respect of his poor life, that being thus condemned, hee might have given unto him the most deadly poison that might be devised, whereby a perfit triall might bee had of the worthines of this medicinable earth. And in this respect, not onely for this pittifull request of his : but also for the commoditie and benefite of all Christendome (if so be the medicine proove answerable to the report), pardoning the offender, we graunted his life upon that condition. Therefore the day of the date of these presents, in the presence of our selfe, and our welbeloved Cosin the Countie George Friderick of Hohenloe, and Lord in Langenburg, and in the presence of all our Nobilitie and Commons, the said patient received a dram and a half of Mercurie Sublimate, mingled with Conserve of Roses, and immediately after it he drank a dram of the Terra Sigillata in olde wine. And albeit the poison did in the judgement of our learned Phisition George Pistor, Doctor in Phisicke, and John Lutzen our Apothecarie, who were both by him all the while, extremely torment and vexed him : yet in the end the medicine prevailing overcame it, whereby the poore wretch was delivered, and being restored to his health was committed to his parents. Whereas

therefore the foresaid Andrew Berthold, hath humbly required to have our Letters Testimoniall for his farther credite, wee have thought good for the furtherance and advancement of the truth, to graunt him these our Letters, signed with our seale Manuell. Given at Langenburg the 25. of Januarie, in the yeare of our Lord. 1581.'

Agricola has a reference to the tablets of Lemnian earth brought from Constantinople in 1530, which he describes as being of a yellowish colour and stamped with Turkish characters. 'The Turks,' he says, 'held it to be the only remedy for plague, using it as the Arabs used Armenian bole.'



FIG. 3.

Another variety of Terra Sigillata emanated from Malta. This was a white earth of a chalky nature which was made into large, thin disks of various shapes bearing the impress of St. Paul and the serpent, as it was considered particularly efficacious in cases of snake-bite (Fig. 3). Among other earths of a similar nature, mention should be made of Terra Samia from the Island of Samos; Terra Sicula, from Sicily; Terra



FIG. 4.

Portugallica, found in Portugal, which bore the impress of a rose; Terra Chia and Terra Cymolia, which were both white earths and considered of great value; and Terra Lignicensis, which was impressed with an eagle (Fig. 7). The latter was also called Axungia Lunae, as it was excavated in the neighbourhood of a silver mine and was supposed to contain a small proportion of that metal. Earths for which similar properties were claimed were also found in Bohemia, in Griffenstein, Velden, Blois and Laubach (Fig. 6). An account of the latter has been left by Geilfus.

In Italy, Terra Sigillata was prepared in several districts and known as Sessana, Toccarese, Oreana and Florentina, the latter being stamped with the arms of the Medici family (Fig. 4). They were all famous as antidotes against poison, and consequently in great demand in Italy during the fifteenth and sixteenth centuries.

An earth excavated in the vicinity of Jerusalem, called Terra Sigillata Hierosolymitanæ, was also highly esteemed. It was white and either bore the impress of a crucifix, the symbol of the Jesuit fathers, a figure of the Madonna, or the head of Christ. Valentin states that he possessed two specimens of these tablets among his rarities, one of which bore the impress of a crucifix and many crosses and was known as 'Mary's milk.' This earth was found in a cave near Bethlehem in which the Virgin Mary was supposed to have hidden with her child, and these tablets were recommended to promote lacteal secretion (Fig. 5).



FIG. 5.

A Terra Sigillata was prepared also in England, and, according to Berlu, there were two varieties, a red and a white, but he gives no description of the impress or seal. It is little wonder that Wirtzung, writing in 1598 on the subject, says: 'Of more than twentie things be these Trociskes made. Wherefore we do leave them to the apothecaries. They be very much used, for most they be forcible against spitting of blood if the same be given with the water of Knotgrasse. They be also good against the bleeding at the nose if the same be annoynted on the forehead, likewise for the bleeding of the pyles.'

Although so many recognised varieties of Terra Sigillata were known and used in the sixteenth century, a large number of false earths were also sold, and Thevet, writing in 1554, states: 'The Jews adulterate it considerably when they sell it to people who have no knowledge of it.'

About the year 1553, Pierre Belon, following the example of Galen, paid a visit to the Isle of Lemnos with the express object of obtaining information as to the collection of the famous sacred earth. He states that the hill from which it was taken was in the neighbourhood of Kotchino. Here on the hillside he found two fountains, of which the

one on the right side of the ascent was perennial, while that on the left dried up in summer. No trees grew upon it except a carob, an elder and a willow, which overhung the perennial spring. The earth, he found, was dug from the upper part of the hill, and the ceremony took place on one day of the year only, namely on the sixth day of August, in the presence of the Turkish governor of the island and a large concourse of people. It commenced with a Mass which was said by the Greek priests and monks in a little chapel at the foot of the hill, and on the conclusion of this they mounted the declivity, and the soil leading to the particular vein of earth was removed. The entrance was so deep that from fifty to sixty men were required to clear it. When the true medicinal earth was reached the monks filled a number of sacks with it and handed it to the Turkish authorities, after which the soil which had been removed was again replaced. The greater part of the earth was dispatched to the Sultan at Constantinople, but some was sold to merchants on the spot, while those who took part in the digging were allowed to carry off a small quantity for their own private use. In no case, however, was anyone



FIG. 6.

allowed to sell it until it had been sealed. Belon collected eighteen different kinds of tablets, many of which, he states, bore different impressions. This difference he attributed to the fact that each lord of the Island of Lemnos was said to have a distinct seal. In addition, there was no lack of counterfeiters, who falsified the seal so well that they made it resemble the original. According to the Greeks and Turks of his time, the most ancient seal was about the size of the thumb and consisted of four letters (Fig. 8). He describes the earth as being made into small cakes of various shades and colours, the prevailing tone being a dull red. Some were soft and fatty, others were gritty when chewed and slightly bitter to the taste. He mentions one variety which was red in colour but mottled with spots of white earth, also a counterfeit which was coated with Armenian bole and sealed with two letters entwined. Another kind of seal he found in two shops only in Constantinople: this earth was sold for a higher price than the others and possessed an aromatic smell.

Instructed by the Austrian ambassador, Stefano Albacario, a Spanish physician of the sixteenth century, journeyed to Lemnos to investigate the famous earth, and his account of its collection corresponds with that given by Belon.

The fame of Terra Sigillata appears to have reached its height towards the end of the sixteenth century, when it is recorded that it was in such great request as an antidote to plague, dysentery and other disorders

that ambassadors, on returning from Constantinople to their native countries, were accustomed to take supplies of it with them to present to distinguished men.

In the early part of the seventeenth century the Island of Lemnos fell into the hands of the Venetians, but was regained for the Turks in 1657 by Mohammed Kiuprili, who regarded it as a victory of such importance that he sent a dispatch to Adrianople to inform the Sultan that he had 'won back the island where the sealed earth was found.'

An interesting account of Terra Sigillata was written in the seventeenth century by Pomet, who, in his *History of Drugs*, states: 'The earth most esteemed is in little reddish cakes, the least sandy and the most astringent you can get. It is much used in medicine because of its astringent quality. The Lemnian earth is fatty, clayey, dry, soft and friable, yellow, white or reddish, and astringent to the taste. Choose your sealed earth that is soft to the touch and which will cleave to the tongue. The Turks, who are the present masters of it, mix it with other earths of the



FIG. 7.



FIG. 8.

same nature and, having kneaded them together with water, make them into little round cakes which they seal with the Grand Signor's seal to make them pay duty.'

Charas, another French writer and author of the *Royal Pharmacopœia*, referring to sealed earths in 1694, says: 'All these earths are fattish and astringent, and are composed more or less of the same substances and have the same taste. The true Lemnian earth is red, which probably accounts for the legend of the mixture of goats' blood.'

Charas claims to have secured a specimen of the true Lemnian Terra Sigillata from which he was able to judge of its properties. He states: 'I have, however, been at a loss in finding any natural smell in the Lemnian Terra Sigillata or in any other, and I do not think it ever existed, unless it had been artificially added by washing it in some aromatic waters.'

Valentin, writing a few years later on the sealed earths of Germany, remarks: 'They are of a fatty, heavy and clayey nature, and are generally shaped into roundish disks, which have an earthy smell, and are red, yellow, brown, or white. Of all the earths Terra Lemnia is the best, and is so highly appreciated that it is considered equivalent to gold.' In his time, about 1704, the tablets were stamped with the Turkish emblem—a half moon with three stars or other Turkish characters. The Sultan considered it of so much importance that they should not be taken out of the country that it was almost impossible to obtain them,

excepting through a consul to whom they were sometimes given. — He describes a Terra Sigillata Turcica and a Terra Sigillata Arabica, both of which were impressed with Turkish characters and pinkish, grey or white in colour.

Of the commercial value of Terra Sigillata, the earliest record I have been able to find is that given in a list of drugs in *The Family Physician*, by Gideon Harvey, printed in London in 1678, where the price of Terra Sigillata is given as 1s. 4d. per ounce. In a price-list of the State Apothecaries of Basel, printed in 1701, Terra Sigillata Silicia is quoted at 2 florins 6 pfennig per ounce, and Terra Sigillata Turcica at 3 florins 4 pfennig per ounce. In another price-list of medicines sold by the apothecaries of Florence, dated 1761, Terra Lemnia is quoted at 5 lire per ounce.

Having considered the early history of this interesting medicament, some account of the extraordinary properties attributed to it may be mentioned. By the Greeks, in ancient times, it appears to have been chiefly used as a remedy for the bites and stings of venomous animals, pain and watering of the eyes, hæmorrhage, dysentery, diseases of the spleen and kidneys, and also as an antidote against deadly poisons. By some writers it is recommended in cases of spotted fever, and it was applied externally to promote the healing and prevent the putrefaction of wounds. By others it was frequently prescribed for scabies, gonorrhœa and dysentery.

Terra Sigillata has often been confused with Armenian bole, but there is ample evidence from the time of Galen down to that of Belon that they were two distinct earths, and that the latter was only used as an adulterant of the former.

Terra Sigillata entered into the composition of many important preparations, and was one of the ingredients in the famous treacle of Andromachus. It also formed part of many other preparations, especially the class known as 'alexipharmic powders,' which were largely used and prescribed for fevers, small-pox and pestilential diseases in the sixteenth and seventeenth centuries. Hungary powder, a famous preparation used in dysentery, contained Lemnian earth, syrup of quinces, and plantain water. An electuary was also made from Terra Sigillata in conjunction with syrup of bearberries and conserve of roses. It entered into the composition of a magisterium, and an oil for application to the eyes which was included in many pharmacopœias. It was included in the first edition of the *Pharmacopœia of the Royal College of Physicians of London*, printed in 1618, among the ingredients in the treacle of Andromachus, and throughout the seventeenth and eighteenth centuries appears in most of the official books on medicine in Europe. As late as 1833 it was included in the *Pharmacopœia Universalis* of Jourdan as Terra Sigillata, Terra Lemnia, or Lemnian Bole, and is described as being met with in round, cylindrical, or flat cakes, of a pale rose-colour, and bearing the stamp of some seal. It was also official in the pharmacopœias of Spain, Brunswick, Geneva and Wurtemberg. Probably its last appearance in any important work on pharmacy is in Grey's *Supplement to the Pharmacopœia*, 1848. He

states : ' Terra Lemnia, Terra Sigillata, Lemnian Earth, or Sealed Earth, is a kind of bole originally brought from the Island of Lemnos, and said to have been obtained from a hill where no plant grew. The Turks, who were formerly the principal dealers in it, made it into little flat, circular cakes, which were stamped with the impression of a seal, and the name Terra Sigillata, Sealed Earth, is applied to it in this state.'

Since the middle of the nineteenth century this once famous remedy has dropped out of use in medicine, and is now practically forgotten.

In 1890, Tozer made a pilgrimage to the ' Isle of the Sacred Earth '. He gives us an interesting account of his visit to the site of origin of the ancient medicament. On arriving at the place where it is obtained, near Kotchino, he found the ground everywhere covered with turf, but otherwise devoid of vegetation. He states: ' The cavity from which the " sacred earth " is taken is an insignificant hole about 50 feet in circumference and 10 feet deep, the bottom of which is now entirely filled up with dry stalks of thistles. The " sacred earth is found at a depth of 3 feet below this ". In the neighbourhood there is, however, another spot which seems to have been excavated, and it is believed that the vein extends for some distance below the soil. The earth, however, is not the same as that which Galen and Belon describe, for while they speak of it as red in colour, the specimens shown to me resembled ordinary clay. Either the original vein has been exhausted or they no longer dig deep enough to reach it. As in Belon's time, it can only be dug on the 6th day of August, and unless this takes place before sunrise all its efficacy is said to be lost. It is also confidently believed in the island that when the ground is opened, the sacred earth wells up of its own accord, but when I questioned a local authority he replied much in the same way as Galen's auditors did to his inquiries about the admixture of goat's blood in the drug.'

The account of the customs observed on the occasion, which continued in full force until five or six years ago, was as follows :—

' On the appointed morning the Governor or his representative proceeded to the spot accompanied by the Mohammedan " khodjas " and the Christian priests, both of whom took part in the ceremony; the former of these offered a lamb as a sacrifice (kourban), of the flesh of which they afterwards partook, while fish was provided for the Christians, who were prohibited from eating meat at that season, owing to its falling in the fast of fourteen days which precedes the festival of the Virgin. According to tradition, sometimes two or three thousand people were present, and as much as seven mules' load of the earth was carried away to be sent to Constantinople. It was then made into pieces of the size of tablets of soap and was stamped with the Government seal. The locality I have mentioned is evidently the same which Belon visited, and probably corresponds to that described by Galen. The resemblances between the ancient and modern customs and beliefs are also very striking. The

sacred character attributed to the earth and the religious auspices under which it was removed, the offerings made on the occasion, the guarantee of genuineness provided by the seal, and the confidence which was placed in its efficacy as a medicine, are features common to the earlier and the later accounts and seem to point to an unbroken tradition. To these one more may be added, which is not the least curious I have mentioned, that the ancient authorities agree in regarding it as an antidote to poison. At the present day small bowls are made on the spot of this material, and are bought by Turks, who believe that a vessel made of this clay neutralises the effect of any poison that is put into it. I purchased several of these from the potter, and each of them is stamped in five places with the Government seal, which bears in Arabic characters the same inscription which Belon mentions as being used in his day, *tinimaktoum*, i.e. sealed earth. This seal, he informed me, was obtained for him from Constantinople twenty years before by an exiled Pasha, who desired that a number of these bowls might be made for him.

'Notwithstanding the long duration of this time-worn belief, it is evident from the neglect into which it has lately fallen that ere long it will be a thing of the past. For several years the Turkish governor has ceased to attend, and, following his example, first the "khodjas" and then the priests absented themselves, and no lamb is now sacrificed. Last year only twelve persons were present. Though the tablets were to be bought in chemists' shops in Kastro at the time of Conze's visit to the island in 1885, I inquired in vain for them, and neither the existing Government nor any persons of the younger generation have heard of this remedy. In the eastern parts of Lemnos, however, it is still in use for fevers and some other disorders, for the women possess nuts of it which they string like the beads of a rosary. These they grate in cases of illness and take a teaspoonful of the powder in water. Not long ago the proprietor of the hillside applied for leave to plough over the spot and sow it with corn, and though for a time this was not allowed by the Government, yet, when the annual celebration has come to an end, the prohibition will safely be ignored, and from that time forward the locality itself will be forgotten.'

The last investigator to visit the site of the famous earth was Hasluck, in 1909. He states he was unable to obtain specimens of it in the capital of the island, but at the pottery below the site he bought bowls of an ill-leigated clay bearing the old inscription *tinimaktoum*. 'The monopoly of the pottery and seal, formerly hereditary in a Turkish family, has lost even this link with the past, and the once priceless antidotal bowls have come down to the very moderate figure of a halfpenny each.'

The importance attached to this remedy in ancient times, and the high esteem in which it was held as a remedy for nearly 2,000 years, led me to the present investigation in the endeavour to ascertain if the remarkable properties attributed to it were real or fictitious.

Some years ago I was fortunate enough to obtain a small sample of the Lemnian Earth of the sixteenth century. On analysis its composition was determined and found to be as follows :—

Silicates	37·23 per cent.
Ferric oxide	4·08 „
Aluminium oxide	13·51 „
Calcium oxide	22·90 „
Magnesia and alkali oxides	1·50 „
Water and carbon dioxide	17·72 „
Moisture as determined by heating at 130°	3·06 „
In 100 parts	

From this it may be judged that the properties of this slightly astringent and absorbent earth have been considerably overestimated, and this no doubt accounts for its disappearance from the pharmacopœias of the present day. We must, therefore, conclude that its virtues, like those of many other ancient remedies, were chiefly due to the mystery surrounding its origin and the superstitions connected with its source.

[Tuesday Afternoon, August 12]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

**SOME EIGHTEENTH-CENTURY FOREIGN OBSTETRIC
FORCEPS IN THE MUSEUM OF THE ROYAL COL-
LEGE OF SURGEONS OF ENGLAND**

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As many of our guests, foreign members of the International Congress, must be interested in the history of the development of the Obstetrical Forceps from the days of the Chamberlens, Palfyn, Levret, and Smellie to the present time, I take this opportunity of turning attention to three forceps of eighteenth-century design now on view in the Loan Collection in the Museum of the Royal College of Surgeons. This collection once belonged to the Obstetrical Society of London, and is the property of the Royal Society of Medicine.

The first is a Dusée's forceps, on which some observations will be made in regard to other forceps apparently developed from that instrument.

The second is a forceps of the type of Grégoire's, bearing on one handle a hinged and guarded sharp crotchet.

The third is a Dietrich W. Busch's forceps, a mere modification of his father's, J. D. Busch's instrument. It will be shown that as early as 1796 the elder Busch published an account of his forceps, the first to bear finger-rests on the handles, near the lock, expressly for the purpose of aiding in traction, the 'finger-rests' often ascribed to the ingenuity of Naegelé, Simpson, and other obstetricians of a later date. The somewhat similar projection on the upper border of each handle in a forceps designed by Aitken and described by him in 1786 was not intended for traction but for quite another purpose.

Dusée, a pupil of Grégoire, never wrote about his own forceps, although he read a paper before the French Académie Royale des Sciences on the arrest of hæmorrhage by circular friction of the gravid or parturient

uterus through the abdominal walls. Paulus de Wind,¹ after studying under Grégoire in Paris, became a resident pupil of Dusée's, in company with a Scotch student named Boswell, who afterwards graduated as Doctor of Medicine and practised in Edinburgh. Dusée showed De Wind and Boswell a forceps which he declared was his own invention. De Wind states that this forceps was the instrument a sample of which was obtained from Dusée by Butter, who exhibited it at a meeting of a Society in Edinburgh in 1733. Butter's report is well known to all who study the history of the obstetric forceps. Dusée died when De Wind was residing with him. De Wind never saw his teacher make use of the forceps which he had invented, and he and Boswell bought the instrument from Dusée's heirs. It fell to the lot of Boswell, so that De Wind had another sample constructed immediately, but on his return home to Middelburg in the Netherlands, he soon found that it was too large and clumsy to be of service. De Wind testifies that teachers in his day designed forceps on theoretical grounds, and after finding their own inventions of no use in practice could not desist from demonstrating them to their pupils. 'Thus we see the useless instrument of Dussé (*sic*) described in full in the Scottish transactions above quoted, and that of Palfyn in Heister's excellent work.' The death of Dusée occurred in 1734, or perhaps a year or two later. De Wind speaks of how in 1734 when in Paris Grégoire showed him Palfyn's forceps, but it was rusty, as though Grégoire never really used it. 'Later on, I lived in the house of Mr. Dussé', who died when De Wind was his resident pupil.

Butter, as is generally known, exhibited, reported, and figured Dusée's forceps in 1733, and Smellie 'procured a pair of *French* forceps' according to Butter's drawing, 'but found them so long and so ill-contrived that they by no means answered the purpose for which they were intended.' Smellie forthwith set to work and devised a long forceps, and he declares that Chapman's forceps, 'which was that originally used by the Chamberlens,' had been adopted in France. Levret approved of the concave notch at the broad free end of each blade in Dusée's forceps, mentioning Dusée by name, whilst in another part of his *Observations* Levret speaks of a forceps with two screw holes, without mentioning the designer's name.

The influence of this broad non-fenestrated forceps seems to have passed, through the agency of De Wind, into the Netherlands. De Wind's strange little forceps, with short blades uncrossed and devoid of any lock of any kind, need not detain us. But Professor Kouwer of Utrecht recently forwarded to me two photographs of a non-fenestrated forceps which is now on view in the Mulder collection, but is not figured or described in Mulder's *Historia Forcipum et Vectium*. It is not the *forceps incogniti* of the *Historia*, Pl. 1, Fig. 7, and p. 17, which, according to Kilian's *Armamentarium Lucinæ Novum*, Pl. XIII A, was a second instrument designed by Palfyn, where each handle did not end in a hook,

¹ 't Geklemd Hoofd geredt, 1751.

but in a knob with a constriction above it. This knob might have suggested to Smellie the 'palm rest' which he certainly introduced,¹ an arrangement ever since conspicuous in English forceps. This digression is necessary in tracing the history of the development of the obstetric forceps after the secret of the Chamberlens had leaked out. Let us turn back to the non-fenestrated forceps photographed by Professor Kouwer. It appears to be a direct development from Dusée's forceps. The double lock arrangement is done away with, the blades lengthened, and the cephalic curve made much wider (as in Dusée's, there is no pelvic curve), whilst the handles and hooks are more delicately finished. The broad non-fenestrated blades recall Dusée's, though it is not clear whether there is a concave notch. This forceps bears a very strong resemblance to the instrument once the property of Dr. Burton of York, the 'Dr. Slop' of Sterne's *Tristram Shandy*, which is preserved in the library of the York Medical Society. But the York forceps is much more like Dusée's, for although it has but one lock, each blade bears at its free end the distinct concavity which is seen in the Dusée's forceps in the College of Surgeons' collection, and in the original drawing of that instrument in Butter's report,² whilst Levret directly ascribes the notch to Dusée. The handles are rather clumsily finished about the hooks, though they are slightly bent outwards, as in the instrument in the Mulder collection. There can be little doubt that the York instrument was used by Dr. Burton in his practice, and as that celebrated physician and archaeologist studied in Holland under Boerhaave it is reasonable to infer that his model was the non-fenestrated forceps in the Mulder collection. Possibly Burton may, on the other hand, have suggested it to his Dutch teacher. In either case the non-fenestrated notched blades imply that his instrument was a modification of Dusée's.

The forceps Burton left behind him is quite unlike that highly complicated instrument described and figured in his *New System of Midwifry* (*sic*)³ and often represented in Atlases of obstetric instruments. Sir Halliday Croom has sent a sample of this clumsy forceps to the museum of this Congress. Probably Burton found it useless, as we can well understand, and quite possibly he damaged some foetus with its blades, and hence certain allusions in *Tristram Shandy* well known to students of

¹ Some authorities, I believe, ascribe the palm rest to Mesnard, but a study of Mulder and Kilian's drawings, as above explained, will rather lead us to believe that Palfyn was the first man to devise that arrangement. Smellie's familiar palm rest may have been designed quite independently.

² Mulder admits that he never saw Dusée's forceps; Kilian represents Butter's drawing in his *Geburtshülfflicher Atlas*, but gives no drawing of Dusée's instrument in his *Armamentarium Lucinæ*.

³ The forceps which Burton actually used, now preserved at York, the original plate representing the forceps which he invented, and the non-fenestrated forceps in the Mulder collection above referred to, are all figured in 'Burton ("Dr. Slop")': His Forceps and his Foes', an article which I recently contributed to the *Journal of Obstetrics and Gynæcology of the British Empire*, January, 1913.

English literature. The instrument which is preserved at York is certainly much more serviceable.

Bing of Copenhagen, Assalini, and Osiander, later on, designed forceps with non-fenestrated blades. The Chamberlens used fenestrated blades, Palfyn's were non-fenestrated like Dusée's, and most probably Dusée copied the blade from the Flemish obstetrician, though the notch on the blade, which Dusée contrived for the avowed purpose of protecting the temporal arteries from compression, was an original idea, as Levret and Butter testified.

I have discussed the literature of the subject at some length in two articles, 'Dusée, His Forceps and His Contemporaries' (*Journal of Obstetrics and Gynæcology of the British Empire*, September, 1912) and 'Dusée, De Wind, and Smellie: An Addendum' (*ibid.*, October, 1912).

The second eighteenth-century forceps to which I desire to turn the attention of members of the International Congress closely resembles Grégoire's instrument in its general characters. It is a big, heavy instrument, weighing over 700 grm. or 1 lb. 9 oz., and measures 43.18 cm. or 1 ft. 5 in. in length; the blades are 21.5 cm. or 8½ inches long. There is no 'curvatura nova' or pelvic curve. So far, this instrument bears all the characters of Grégoire's forceps as described by Boehmer in 1746. We must remember that the inventor never described his own forceps. The instrument of which I am speaking differs from Grégoire's in certain respects. Dr. T. W. Wilson has sent to our museum, from Trinity College, Dublin, a typical Grégoire's forceps, with a simplified lock. In the forceps from the College of Surgeons not only is the lock simpler, but the handles are straighter, and there is no space between the tips of the blades when closed. Lastly, there is a hinge on one handle to which a sharp crotchet, now lost, was formerly fitted. As for the simpler lock, Kilian (*Armamentarium*, Fig. XIV) represents a Grégoire's forceps with a simple lock, not identical, however, with this lock, a mere screw which must have required a key. The straighter handles assimilate this instrument to one of Coutouly's forceps, which also had a simple lock (Mulder's *Historia*, p. 60, and Pl. X, Figs. 1 and 2), but Coutouly's blades bore the pelvic curve. The meeting of the tips of the blades when closed also reminds the observer of Mulder's 'Coutouly 1'.* Mulder under 'Distantia cochlearium ad apicem' gives Grégoire as 1¼ inch and Coutouly 1 as *nulla*. This is a very essential distinction, as it bears on the question of the forceps as a compressor. The hinge on the handle is an essential modification. It once bore a sharp crotchet which, when not wanted, could be covered by a metal guard fitted on to the handle higher up, whilst when the crotchet was put to use the guard could be slipped under it so as to support and fix it. Gifford and Hody figure a forceps designed by Freake, Surgeon to St. Bartholomew's Hospital, in *Cases on Midwifry (sic)* (1734), where one handle is turned inward ending as a sharp crotchet, without any hinge, and there is a guard like that above described, which can be made to cover it. This Freake's

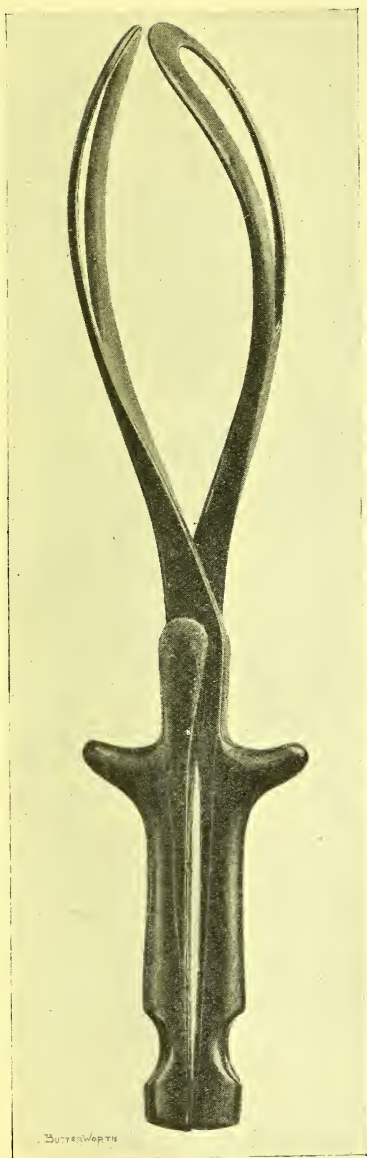


Fig. 1.

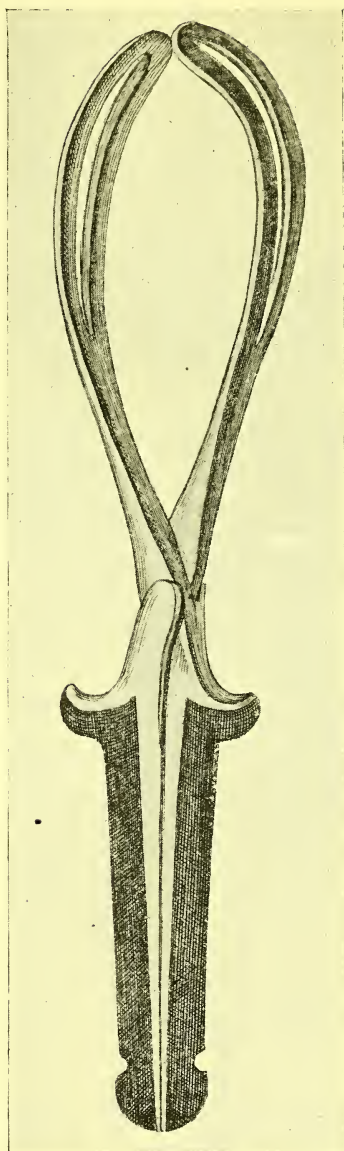


Fig. 2.

forceps has been copied from Giffard's *Midwifry* into Mulder's and Kilian's Atlases, but nothing more is known about it, and no mention of it can be discovered in Freake's writings.

Freake's contrivance surely suggested the hinged crotchet. A perfect forceps of this type is preserved in the Obstetrical Museum of the University of Edinburgh, the crotchet and its guard being complete. It is now on view in our museum. Boehmer published the first account of Grégoire's forceps in 1746. As for this instrument, which is not figured in the standard Atlases above quoted, the date of its construction is unknown. Did Grégoire or Freake introduce the sharp crotchet arrangement? Did either or did a third obstetrician contrive the hinged crotchet? Perhaps some members of the Congress can offer a solution of this question.¹

The third forceps to which I turn the attention of the members of this Congress was the first to bear on its handles the prominent upturned horns known as 'finger-rests' or, less correctly, 'flanges,' associated in this country with the name of Sir James Simpson. Yet they really first appeared at the end of the eighteenth century.

This forceps is a modification, by Dr. Dietrich W. Busch (1788-1858), of an instrument described and figured by his father Johann D. Busch in 1796. The modification is trifling, the handles in the younger Busch's forceps being prolonged upwards for 2 inches (5 cm.) above the lock. It is clearly indicated in a drawing of an instrument in Kilian's *Armamentarium Lucinæ*, Pl. XXVIII, marked 'D. W. Busch'. The essential feature, the finger-rests on each handle near the lock, remained the same.

Kleinwächter, in his biography of Dietrich Wilhelm Heinrich Busch in Hirsch's *Biographisches Lexikon für hervorragende Aerzte*, concludes by saying that Dietrich deserved high commendation for the addition of the finger-rests known by his name to the forceps, by which that instrument was at last made to fulfil its right aim—traction without compression.²

It will be shown that the addition of the finger-rests to the obstetric forceps to facilitate traction must be credited not to Dietrich but to his father Johann, who figured and described them when Dietrich was only eight years of age. It will further be explained that a finger-rest arrangement is to be seen in a forceps figured and described by Aitken in 1786, but the inventor designed it not for traction but for the protection of the parts by the operator's finger. Johann Busch may have seen or read

¹ This modified Grégoire's forceps and the Edinburgh forceps above noted are illustrated by photographs in 'A Demonstration of Some Eighteenth-century Forceps', *Proc. Royal Soc. Med.*, vol. vi, Sect. History of Medicine, pp. 54-76.

² 'Ein grosses und dauerndes Verdienst erwarb er sich durch die Beigabe der nach ihm bekannten Haken am oberen Griffende der Zange, da dieses Instrument erst von da an seinen eigentlichen Zweck — Zug ohne Druck — erfüllt.' Dietrich Busch (1788-1858), at first famous for field hospital management, taught and practised Obstetrics after 1817. He prepared a once celebrated *Atlas geburtshilflicher Abbildungen*.

of this forceps, and if so it may have suggested to him the horn-like finger-rests which he introduced, but his 'rests' were practically original as they carried out what was in 1796 an original idea. Dietrich, the son, more celebrated than his father, proved the value of the 'rests'.

I will now describe this forceps: It is a heavy instrument, weighing 1 lb. 4 oz. (567 grm.). Its entire length is precisely 14 inches (35.6 cm.), the blades taking up $7\frac{3}{4}$ inches (19.7 cm.). The greatest breadth of the blades (close to the tips) is $1\frac{3}{4}$ inches (4.4 cm.), the greatest breadth across them amounts to $2\frac{5}{8}$ inches (6.6 cm.), and when the blades are closed the distance between their tips is $\frac{7}{8}$ inch (0.9 cm.). The fenestræ are 4 inches (10.16 cm.) in length and are $\frac{7}{8}$ inch (2.2 cm.) in breadth near their upper ends. The whole instrument is covered with black rubber; this method of protecting the surface of the forceps was introduced by Osiander within a few years of the end of the eighteenth century,¹ but many forceps were coated in this manner, on the Continent, down till comparatively recent days.

The blades have a fairly marked pelvic curve and are flattened antero-posteriorly for some way above the lock, without distinct shanks. The inner surface of the blades is slightly convex.

The handles have, like the English forceps of pre-aseptic days, a wooden cover which includes the familiar palm-rest introduced by Smellie and, at its upper extremity, the equally familiar finger-rests about which more will be said presently. The lock, too, is English, like the palm-rest, for reasons which will be made clear, but instead of both blades contributing a clip to the lock, only the handle of the left blade has a clip. Later foreign authorities, who preferred the English to Levret's and Brünninghausen's lock, adopted this modification. The handles when closed do not touch, except near the lock and the free extremity, a modification of the original pattern. The finger-rests are the special or, more accurately, the generic feature of this forceps, and J. D. Busch undoubtedly introduced this genus of forceps. The handles are prolonged for $1\frac{1}{2}$ in. (3.8 cm.) above the finger-rests, till they meet at the lock; this is a specific character, representing Dietrich Busch's modification of his sire's forceps. We will now discuss the Busch instrument.

J. D. Busch's original description of his forceps and of the contrivance which he invented, known as the 'finger-rests' or 'flanges', and always associated in England with Simpson's instrument, appeared in 1796 in Stark's *Archiv für die Geburtshülfe, Frauenzimmer- und neugebohrner (sic) Kinder-Krankheiten*, vol. vi, pt. 3. Johann David Busch's article is

¹ In 1798, J. W. Schlegel writes in his additional notes to his *Geschichte der Zangen und Hebel*, a translation of Mulder's *Historia Forcipum* into German: 'Osiander giebt zwar keine eigene Zange an, doch hat er eine Veränderung erdacht, die an allen Zangen anwendbar ist. Diese Erfindung besteht in dem Ueberziehen der Zangen mit einem künstlichen Federharze' (loc. cit., p. 120). Osiander's once well-known forceps appeared about two years later. A number of 'Prague pattern' forceps coated with india-rubber were sold in England not many years ago.

entitled 'Beschreibung einer neuen Geburtszange, nebst einigen Beobachtungen über ihre Anwendung'. It is accompanied by a drawing of the forceps and of its left blade. The former is reproduced here. J. D. Busch was at the time Professor and Teacher of Midwifery in Marburg. He had learnt the use of Levret's forceps from Stein, but afterwards tried Smellie's instrument. When he worked under Stein, Busch found that Levret's long forceps acted more by compression than by traction or leverage. This, Busch admitted, was to a certain extent useful and necessary, as it assisted a natural process, the moulding of the foetal head. The blades seemed to him, for reasons which he explained at length, not entirely satisfactory, and Busch pointed out several deficiencies in Smellie's forceps which, being well known to us, need not be dwelt upon. 'A special defect in the English forceps is its shortness, which indicates that the English do not apply the instrument until the foetal head lies completely in the pelvic cavity.' In Smellie's forceps when in action, traction exceeded pressure, whilst in Levret's pressure was greater than traction. J. D. Busch, therefore, neutralized, as he believed, the defects and combined the advantages of the French and English forceps. The pelvic curve was intermediate and began immediately above the lock, so that the handles, when the blades were applied, lay at a more convenient angle for the operator, who could grasp them and draw down the foetal head, keeping traction in the right axis. The cephalic curve was sharper near the tips of the forceps than in Levret's, but lesser than in Smellie's. Busch's forceps, the inventor points out, differ from Smellie's in the fenestræ, which are made longer and prolonged downwards so that the operator can apply Levret's tapes for traction if desirable. Busch improved on Smellie's blades by making their inner surfaces extremely smooth, the borders of the French instrument being, in his opinion, too sharp, 'which repeated experience has taught me is more likely to do harm than to be of any real use, particularly when they are not exquisitely finished, and are employed by obstetricians of moderate merit, who make up by far the great majority.'¹ Busch avoided the marked concavity of the inner surfaces of the blades which made the edges too prominent.

The inventor dwells on his improved handles. He adopted Smellie's lock 'unchanged'. I have already noted that in the instrument here exhibited only the handle of the left blade bears a clip. Busch further asserts that he made Smellie's handles longer, so that they could be easily grasped with both hands. As may be seen in the original drawing and in the instrument here described, Smellie's palm-rest at the free end of the handles with the depression for tapes is retained. To improve the grasp on the handles, Busch added the blunt, prominent horns turned upwards, projecting from the upper limit of the wooden part of the handles at the lock, an arrangement which he found more convenient than

¹ 'In den Händen mittelmässiger Geburtshelfer, die doch bei weitem den grossen Haufen ausmachen' (loc. cit., p. 444).

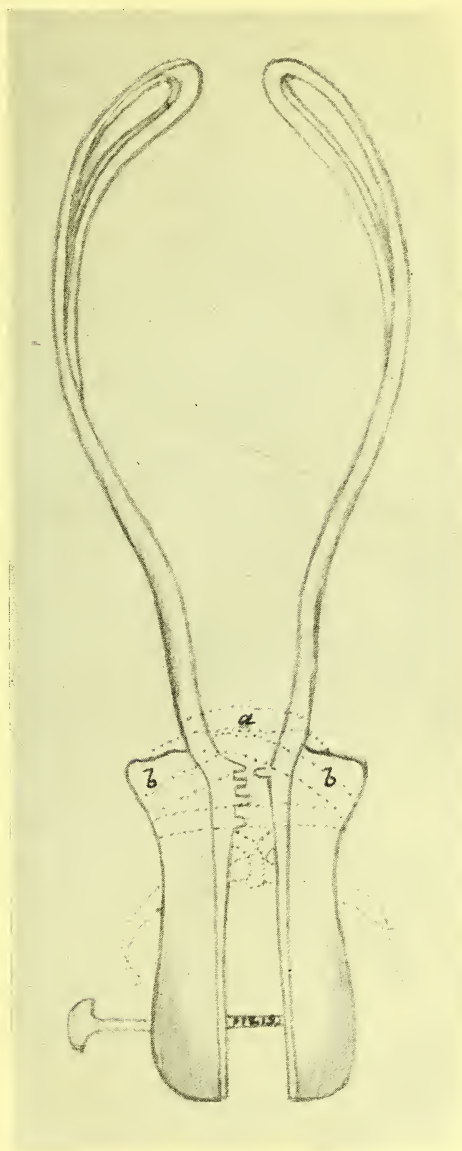


Fig. 3.

the upturned hooks at the free end of Levret's forceps. Busch informs us that when the blades had been applied and locked, he grasped the handles with one hand, and hooked the fore and middle fingers of the other hand over the horns or finger-rests, so that the upper part of the handle was well held by that hand. Then he explains how, as is now familiar to all obstetricians, firm traction in the right axis can be ensured.¹

An elementary finger-rest arrangement, as I have already observed, is seen in a forceps devised by Aitken and reported and figured by that obstetrician in the third edition of his once well-known treatise. This instrument was distinguished in his days as Aitken's third pattern, and Mulder represents it and describes it in his *Historia*, Pl. V, Fig. 11, and p. 71, but I have reproduced Aitken's original drawing. It was a complicated forceps, and the blades sprang from long shanks running parallel and wide apart from each other for some distance. I note this detail, firstly because these long shanks with a space between them are, like the finger-rests, associated in the minds of British² doctors and dealers with Simpson's forceps, and secondly because Evans of Oswestry was said by Smellie and others to be the deviser of these straight wide-parted shanks, the gap being made for the operator's finger. There is also a screw pin arrangement on the handles, and Aitken, it will be seen, accuses Evans of implying priority in its introduction.

But one peculiarity in Aitken's third pattern specially interests us in association with Busch's forceps. The upper extremities of the wooden lining of the handles bear each a 'blunt knob', as Aitken calls it, meant to rest the fingers. The 'rests', however, are not intended for traction, as the author, it will be seen, clearly explains to his readers.

The first edition of Aitken's *Principles of Midwifery or Puerperal Medicine* (1784) is a mere synopsis. The author refers to his modified lock,³ a matter we may dismiss as not to the point in regard to the finger-rests. In the second edition, 1785, there is an instructive drawing (Pl. X) of the forceps applied to the after-coming head, but the artist does not represent or indicate the operator's hand. Both these editions of Aitken's

¹ J. D. Busch adds that in many difficult cases he used Starke's screw pin, which strengthened the lock. This contrivance is not represented in Mulder's reproduction of Starke's forceps, which, like Busch's, had the English lock and palm-rest (*Historia*, p. 74, and Pl. VI, figs. 1 and 2), but is mentioned with an expression of disapproval in Schlegel's translation of Mulder's work. It is omitted in J. D. Busch's drawing of his own forceps, and never came into general use.

² Charpentier wrote in 1890: 'Une particularité de construction est spéciale au forceps de Simpson: à partir du point de jonction, les branches s'écartent brusquement, puis elles se coudent à angle droit, pour monter parallèlement jusqu'à la partie fenêtrée des cuilliers' (*Traité pratique des accouchements*, vol. ii, p. 685). A glance at Plate V, Figs. 7 and 11, in Mulder's *Historia Forcipum*, 1794, will show that this parting of the shanks was introduced by Evans and Aitken (see Aitken's original drawing, reproduced in this paper, Fig. 3) long before the days of Simpson.

³ Represented clearly in Aitken's drawing in his third edition. We can hardly be surprised that it never came into general use.

Principles are to be found in the library of the Royal College of Surgeons.

The third edition of Aitken's *Principles*, from which Mulder quoted, is not to be found in the College library. Fortunately, the library of the Royal Society of Medicine possesses a copy. It is dated London, 1786, and includes a drawing of the forceps in question much more complete than Mulder's figure, Pl. V, Fig. 11, in his *Historia*, for the 'fillet' or tape tied round the handles near the lock is indicated in dotted lines. On that account, I reproduce the drawing in the third edition of Aitken's *Principles*. The descriptive letter-press reads :

' Fig. 6.

' A view of the forceps with the graduated lock which requires the fillet, as represented by the dotted lines.

' It is intended that the middle finger of the hand employed in managing the forceps shall go between the blades, above the lock *a a*, while the fore and ring-fingers rest on the adjacent blunt knobs ¹ *b b*. By this disposition, the mother's parts are fully protected, because the fingers are interposed and the other hand being disengaged can either support the perinæum, or give other requisite assistance.

' I think in this way every forceps should be held.

' I pointed out the use of the screw in the handles to Archibald Young, Instrument maker in this city, who brought me a forceps he was making for a *Doctor Evans* of Shropshire, and was not a little surprised to find that that gentleman had published it as his invention soon afterwards.'

On Plate K in this third edition, the drawing Plate X in the second edition of the *Principles* is reproduced, with the tape or 'fillet' (a confusing term), and with the 'screwed nail with a broad head' near the lock. In the drawing of Aitken's forceps, here reproduced from the third edition, the screw is near the free end of the handles.² There is, as before, no sketch of the operator's hand.

From the above quotations and dates we can see that Aitken contrived a forceps with the handles widened out near the lock so that the fore- and ring-fingers might rest in them. Hence it might have suggested to J. D. Busch his horned finger-rests. Mulder's *Historia* was published in 1794, two years before Busch's drawing appeared, and it was widely studied in Germany. Busch possibly had read Aitken's third edition of his *Principles of Midwifery*.

Whether he ever knew anything about Aitken's finger-rest arrangement or, on the contrary, introduced the thick and prominent horn-like finger-rests without having seen or heard of the Scotch obstetrician's contrivance, to Johann D. Busch should be ascribed the credit of having invented the finger-rest as adopted by Simpson and other later authorities. For

¹ The italics are not in the original.

² In the first and second forceps designed by Aitken the handles had no 'blunt knobs' or anything else like a finger-rest. Samples of the earlier types are to be seen in the forceps from Edinburgh and Dublin in our museum. The Dublin specimen of Aitken's forceps has a broad shoulder to its handle below the lock.

Busch plainly shows us that he made the horns to facilitate traction by means of the fore and middle fingers, whilst Aitken as clearly explains that the 'blunt knobs' were made for the fore- and ring-fingers to rest on, so as to protect 'the mother's parts', and does not imply that the fingers were to be used as active agents in traction. If J. D. Busch had seen Aitken's 'blunt knobs', he was quite justified in acting on a suggestion and broadening out the upper end of his own forceps for a purpose other than the protection of the maternal parts, which can be better effected by other means. Most assuredly J. D. Busch introduced the finger-rests. His son Dietrich Busch was a boy eight years of age when his father published the report and drawing of his new forceps.

Naegelé and Simpson afterwards adopted the finger-rests, as did other distinguished obstetricians. Stoltz in 1839 and Levy of Copenhagen in 1866 applied jointed finger-rests to their forceps. A sample of Levy's instrument is preserved in the Loan Collection in the Museum of the Royal College of Surgeons, and is now on view in the museum of this Congress.

ILLUSTRATIONS

FIG. 1. Dietrich W. Busch's forceps. Photograph of the instrument exhibited before the Section.

FIG. 2. Johann D. Busch's forceps. Photograph of plate in Stark's *Archiv f. Geburtshülfe*, etc., vol. vi, part iii, 1796. The earliest representation of a forceps bearing finger-rests.

FIG. 3. Aitken's forceps, third pattern. After plate in Aitken's *Principles of Midwifery*, 3rd ed., 1786, showing the 'blunt knobs' (*b b*). See text.

[Tuesday Afternoon, August 12]

SECTION XXIII
HISTORY OF MEDICINE

INDEPENDENT PAPER

NOTES ON THE TYPHUS CHARACTER OF THE
PLAGUE OF ATHENS¹

By RAYMOND CRAWFURD, M.D., F.R.C.P.

THE statement of Thucydides, that all other diseases took on the similitude of the dominating pestilence, is one that reappears constantly in the literature of epidemic disease. The frequent concurrence of plague and typhus led such acute observers as Diemerbroeck and Sydenham to believe that the one disease might be transformed into the other. The same close association of relapsing fever and typhus was constantly noted, and we know now that the explanation lies in the fact that each disease is transmitted by the body-louse, as plague is transmitted by the flea. Bearing in mind the close and constant association of these and other acute infectious fevers, it is no matter for surprise that they should have been regarded as states and stages of one pestilential process, differing from one another, not in kind, but only in degree. As Bacon says, 'putrefaction rises not to its height at once.'

The acute, often abrupt, onset of the Athenian pestilence, with profound depression, severe headache, and suffused conjunctivæ, though met with in a moiety of cases of plague, is eminently characteristic of typhus. The striking appearance of the blood-shot eyeballs has led to much confusion between the two diseases. The aspect of the tongue and fauces inclines rather to the side of typhus. In each disease the tongue is at first heavily coated with a thick white fur, and tends later to become dry and parched. But in typhus there is a special tendency, as the disease advances, for the tongue to bleed from fissures at the edges. So frequently is this the case, that this feature has been regarded as of diagnostic value in the presence of an outbreak of typhus. A boggy reddened appearance of the fauces is usual in typhus, and is seen also in a proportion of plague patients.

¹ Curschmann's contribution in Nothnagel's *Encyclopædia of Practical Medicine* is perhaps the most graphic and succinct account of typhus fever in modern medical literature. The record of Thucydides should be studied closely side by side with this. Murchison's article, in his *Treatise on Continued Fever*, though admirable, is so diffuse as to make comparison difficult.

Unnatural and even fœtid breath, may be met with in any acute infectious fever, but fœtor is in no way characteristic of any. Doubtless it was far more common in times when the alphabet of oral hygiene had not yet found acceptance as a necessary detail of medical regimen. Murchison describes the breath of typhus patients as fœtid, and, in addition, it is well known that a repulsive odour may be given off from their bodies. Salius Diversus mentioned it three centuries ago, and it has been a commonplace of many subsequent writers. Curschmann failed to detect it, and attributed its absence to the free ventilation of the sick wards. A layman, as Thucydides was, might well ascribe to the breath a fœtor permeating the whole atmosphere around the patient.

Sneezing has long been associated in popular tradition with plague, and an old legend refers the association to the plague of Rome at the commencement of the pontificate of Gregory the Great, when it is said that those who sneezed died. The most careful and observant of modern physicians do not, however, confirm the connexion. Russell states that he was on the look out for it during the plague of Aleppo and did not observe it: Simpson does not even mention it. Nor does it appear to be noteworthy as a symptom either of typhus or of any other acute infectious fever, though it would be in accord with the swollen and congested state of the nasal mucosa in typhus, to which Curschmann has drawn special attention. Perhaps the tradition is a mere old wives' tale, for sneezing has been regarded as a sign of ill-omen from great antiquity, and as far back at least as the composition of the *Odyssey*. Aristotle frankly confessed himself unable to explain the connexion.

Curschmann met with hoarseness and laryngeal catarrh commonly in typhus, but though catarrh of the whole respiratory tract may occur in plague, it is not an outstanding feature. Cough is frequent in either disease: so, also, is vomiting, often of great severity: and if protracted will exhibit a succession of changes of colour, such as Thucydides has described, first the food contents of the stomach, then green bilious vomit, and finally blood, either red or altered to brown or black. Hiccough and empty retching are liable to ensue on severe vomiting from any enduring cause.

It is not clear to what Thucydides appropriates the term *σπασμός*: the context would suggest that spasm of the diaphragm, such as accompanies protracted vomiting, is indicated. But it may also signify true convulsions, which are an occasional complication of both diseases. Convulsive tremor of the limbs, and indeed of the whole body, is habitual at the height of typhus, and is not infrequent in plague.

We should naturally look to the appearance of the skin and of the eruption to afford criteria for a sure diagnosis, but such is not the case. True, there is a remarkable resemblance to Murchison's description of the skin of typhus patients in an English hospital. 'The face', he says, 'is often flushed. The flushing is general over the entire face. It is never pink: sometimes it is reddish or reddish-brown, but more com-

monly it is of a dusky, earthy, or leaden hue : in grave cases it may be livid.' No corresponding appearance of the skin is to be seen in plague.

Thucydides has described the eruption as consisting of *φλύκταιναι μέραι καὶ ἔλκη*, words that have generally been rendered as 'small blisters and ulcers', and for this reason have been held to exclude positively a diagnosis of typhus fever. So certain a conclusion is hardly justified by the facts. Outbreaks of gangrenous dermatitis, in which multiple bullæ or blisters, leaving an ulcerated base, have broken out over the body surface, have been not uncommon features of a typhus epidemic, and from their virulently contagious character such outbreaks would have been more prone to occur amid all the neglect and destitution of a beleaguered garrison. Murchison has described the resulting appearances in the following words : 'I have seen bullæ filled with light or dark fluid, or large pustules appear on various parts of the body during the progress of the fever. Stokes has observed bullæ of this description followed after bursting by deep ulcers with sharp margins.' But extensive ulceration such as this must inevitably have left permanent scarring, at least as marked as the 'pitting' produced by small-pox, and we can hardly presume that this could have escaped the critical Greek eye of so keen an observer as Thucydides. The whole question arises of the exact significance of the words *ἔλκος* and *φλύκταινα*.

In his treatise *Περὶ Ἑλκῶν* Hippocrates uses the term *ἔλκος* not only for open wounds and ulcers, but also for burns, wheals, and wounds in general. Homer uses it for wounds of every kind. It so happens that the wounds of the *Iliad* are almost all the open wounds produced by spear and arrow, but Homer also uses it for the bite of a snake¹ and for the wound inflicted by lightning.²

Bion³ uses it in consecutive lines for the wound caused by a spear, and in the generic sense :

Ἄγριον, ἄγριον ἔλκος ἔχει κατὰ μηρὸν Ἀδωνίς
Μεῖζον δ' ἂν Κυθήρεια φέρει ποτικάρδιον ἔλκος.

Aeschylus⁴ and Sophocles⁵ use it also in the wider sense, as in

Πόλει μὲν ἔλκος ἐν τῷ δήμῳ
and

Τί γὰρ
γένουτ' ἂν ἔλκος μεῖζον ἢ φίλος κακός.

The inference to be drawn from these passages is that *ἔλκος*, although usually indicating an open wound, is used with no precise significance.

The same difficulty attaches to the word *φλύκταινα*. Though Hippocrates uses the word frequently, there is no single passage in which the precise significance is clear beyond all doubt. He applies it to chilblains,⁶

¹ *Iliad*, ii. 723.

³ *Adonis*, 16-17.

⁵ *Antigone*, 652.

² *Iliad*, viii. 405 and 419.

⁴ *Agamemnon*, 645.

⁶ *On Ancient Medicine*, 16.

to an eruption on the skin of subjects of empyema,¹ to lesions appearing on the tongue in fatal septic cases, and so on. In one passage, in which he speaks of a *φλίκταινα* arising from rubbing the skin with vinegar, he seems to indicate a blister.

The first clear definition of the term we have is from the pen of Celsus, who defines it as a discoloured pustule, that breaks and leaves an ulcerated base : (genus pustularum, cum plures similes varis oriuntur nonnunquam maiores, lividae aut pallidae aut nigrae aut aliter naturali colore mutato : subestque iis humor ubi hae ruptae sunt, infra quasi exulcerata caro apparet). There are several passages in Aristophanes which indicate that he at any rate applied the term as we do to a blister lesion : but at the same time there are other passages, in which this exclusive use is by no means so sure. The lesion resulting from handling the oar² or carrying a lance³ cannot well be other than a blister. And there is a passage in the *Ecclesiazusae*⁴ which seems even clearer :

ἀλλ' ἔμπουσά τις
ἐξ αἵματος φλίκταιναν ἡμφιεσμένην.

'Some vampire bloated with blood like a blister.' The image must be that of a vampire, so bloated with blood, that its body seems actually enveloped in it, simulating a blood-blister. Aristotle applies the term to the bite of a shrew-mouse, which would presumably produce a solid local swelling, and not a blister. Procopius uses *φλίκταινα* for the black cutaneous lesions of oriental plague, known nowadays as pustules ; he says, too, that they were the size of a lentil, but does not mention terminal ulceration. Procopius is so precise in his medical terminology, that it is improbable he borrowed the term from Thucydides without appreciating its exact significance : far more likely he adopted it from the medical terminology of his day.

There is something to be said for appropriating the terms used by Thucydides to the pustular lesions of oriental plague. Many writers, ancient as well as modern, have described the so-called pustules as commencing in some cases as blisters and terminating in eroding ulcers. But, on the other hand, we know nothing of epidemics of plague without a considerable proportion of bubonic cases, while we do know from the narrative of Procopius that plague has maintained its characters unchanged for 1,500 years. In an epidemic of plague in which death did not supervene till the seventh or ninth days the presence of buboes would be the outstanding feature of the disease, and Thucydides does not even mention them.

Assuming that typhus fever also has maintained its characters unchanged, and that the external manifestations of the Athenian pestilence were not of the exceptional type we have alluded to, but

¹ *Coacae Praenotiones*, 396.

² *Frogs*, 236.

³ *Wasps*, 1119.

⁴ *Ecclesiazusae*, 1057.

of the type habitually associated with the disease, can it reasonably be contended that the terms *φλίκταιναι* and *ἐλκη* are applicable to these ?

Murchison says that ' according to its colour, the eruption may be said to pass through three stages, viz., (1) pale dirty pink or florid ; (2) reddish-brown or rusty ; (3) livid or petechial '. In the first stage, it is generally admitted that except on careful observation, and in a good light, the faint diffuse maculæ (spots) are apt to escape detection, so that the impression is of a general suffusion of the skin,—what in fact Thucydides terms *ὑπέρυθρον*.

In the second stage the deeper coloration of the spots throws them into relief as individual lesions against the paler background of general suffusion of the skin. Can it be that this is indicated by the vague term *φλίκταινα* ? Be it remembered that Thucydides was a layman, describing, as he says, the lesions of a hitherto unknown disease. Every physician is well aware of the restricted terminology that the laity possess for the description of multifarious lesions. Medicine itself is not exempt from the same confusion, for when physicians glibly speak of the subcutaneous hæmorrhages of typhus as petechiæ they forget that the word throws back to *petigo* (a scab).

There remains then for the third stage of the eruption—the hæmorrhagic stage—the term *ἐλκος*, a generic term applicable to almost any lesion, and having no philological affinity to the Latin 'ulcus' and the English 'ulcer', with which medical usage has confused it.

Reviewing, then, all the facts, it cannot be held that the description of the eruption, as given by Thucydides, is sufficient to negative a diagnosis of typhus fever, which disease is otherwise depicted to the life in all else that he says of its clinical course and characters. Thucydides was so impressed with the intensity of the internal fever, that he expected certainly to find a corresponding temperature of the body surface : hence his surprise is obvious at finding it not excessively hot. For all that, sufferers were ready to cast off every shred of clothing, till they were naked, and longed to throw themselves into cold water. Some did actually plunge into cisterns, but no amount of water sufficed to slake their thirst. Procopius mentions this same fierce longing to fling themselves into water among the plague victims of Byzantium, but raving delirium of this kind is far more characteristic of typhus than of plague. Curschmann depicts the fierce medley of wild ravings, mingled with frantic efforts at self-destruction, which gave an unmistakable character to a ward of typhus patients. Murchison, quoting from Bancroft, says, ' Some leaving their beds would beat their keepers or nurses and drive them from their presence : others, like madmen, would run about the streets, markets, lanes, and other places : and some again would leap headlong into deep waters.' Intolerable restlessness and insomnia fill up the cup of misery to overflowing. Curschmann confirms the observation of Thucydides, that typhus cadavers exhibit very little emaciation,

but this does not help to differentiate typhus from other acute fevers of equally brief duration.

Death commonly occurred on the seventh or ninth day. One recognises here submission to the authoritative doctrine of critical days. Hippocrates¹ defined them on the basis of equal and unequal numbers :

Equal—4, 6, 8, 10, 14, 28, 30, 48, 60, 80, 100.

Unequal—5, 7, 9, 11, 17, 21, 27, 31.

Taking the mean of the numbers, the plague of Athens claimed its victims for the most part about the eighth day of the disease. A layman would hardly have had the opportunity, or indeed the inclination, to make an exact statistical computation, and in this fact perhaps lies this unexpected lapse of Thucydides into subservience to medical orthodoxy.

With regard to the day of death in typhus fever, Curschmann says, 'When death is caused simply by the severity of the disease, it occurs usually in the middle or second half of the second week. A fatal termination before the ninth day, or as early as the fifth or sixth day, occurs only in the most severe forms of the disease, or in individuals with little resisting power.' Now, not only was the Athenian pestilence severe in type, but there was also an almost complete absence of the nursing and medical regimen, that will have served to prolong the duration of cases, that have ultimately proved fatal, in recent epidemics. In plague death usually occurs between the second and sixth days, seldom later, and few patients survive to the seventh or ninth days without the appearance of buboes.

If the victims survived this period, the disease fastened on the bowels and produced violent ulceration (ἐλκωσις). Initial constipation, followed, as the disease develops, by diarrhoea, which is sometimes profuse and intractable, is met with both in typhus and plague.

The disease began in the head and gradually passed through the whole body. If the sufferer survived so long, it would often seize the extremities and make its mark, attacking the privy parts and fingers and toes. Some escaped with the loss of these and with the loss of their eyes. This terminal gangrene of the extremities is of frequent occurrence in typhus, but is rare in plague, and very rare in other acute infectious fevers. Curschmann says, 'Many patients continue to suffer for some time after defervescence (of typhus fever) from gangrene of the ears, fingers, toes, tip of the nose, and skin of the penis and scrotum, arising during the febrile period. Gangrenous changes around a carbuncle are occasional in plague, but not as an independent affection of the extremities. Neglected plague buboes, even nowadays in Indian epidemics, do exceptionally become gangrenous, as the result of an intercurrent erysipelas. Necrotic ulceration of the eye-balls is well authenticated as a complication of typhus as well as of plague.'

Some recovered from the disease, but with complete loss of memory. This, again, is a frequent consequence, usually temporary, but sometimes permanent, of typhus. According to Curschmann, 'the patient's recollec-

¹ *Epidemics*, iii.

tion of his illness is almost always very limited in severe or moderately severe cases. True psychoses appear to be rare during convalescence. Mild melancholia and hallucinations are sometimes seen, and even mania has been observed.'

The combination of gangrene with mental symptoms inevitably suggests the thought of ergotism (poisoning by a fungus of rye-grain), and Read and Kobert have expended much ingenuity in support of this hypothesis. One of the Athenian corn routes did actually tap the northern shores of the Euxine, and Southern Russia has been one of the chief centres of epidemics of ergotism. But there is no need to invoke this condition to explain symptoms which are commonly encountered in typhus, and no warrant either for so doing, seeing that the clinical features of the visitation had little in common with ergotism. Kobert's ingenious arguments in favour of ergotism, superimposed on some other unidentified disease, merely substitute one *impasse* for another.

Thucydides observes that one feature distinguished the Athenian pestilence from ordinary diseases. Birds and beasts of prey, which feed on human flesh, would not as a rule touch the bodies, but if they did, they died. In fact the birds of prey disappeared altogether, and were not to be seen, either about the bodies or anywhere else. In the case of the dogs this was particularly noticeable, because they live with man. The paragraph is curiously involved, but contains three statements of fact :

1. That vultures were nowhere to be seen.
2. That dogs avoided the dead bodies as a rule, but that when they did not, they took the disease.
3. That other animals which feed on carrion, and within the walls of Athens there can hardly have been other than rats and cats, and possibly pigs, were affected like the dogs.

There is no evidence as to the effect on cattle, horses, sheep, and goats, because all these had been removed to Eubœa.

The phenomenon of the disappearance of birds of prey before and during outbreaks of epidemic pestilence has been asserted again and again in literature. Yet it is very doubtful if the observation rests on any sure evidence. Search has brought to light only one occasion on which the truth of the fact has been deliberately tested, and then it was directly contradicted. Russell says that at the commencement of the plague of Aleppo, in which true plague was ushered in by typhus, no desertion of birds was observed, and no mortality among cattle. The old-time fancy that pestilence engendered in the clouds distempered the atmosphere almost necessarily involved the presumption that the feathered inhabitants of the air would be the first to feel its ill effects. In the same way the belief that pestilence might reach the atmosphere from the exhalations of marshes, led to similar fables attaching themselves to the marsh-dwelling frog. Aristotle alludes to the increased number of frogs in pestilential years, and Bacon and Horstius repeat his statement.

These children of the marsh are conceived of as products of its undue activity. Horstius went so far as to assert the same of snails.

Livy¹ clearly asserts the disappearance of vultures from Rome before and during the epidemic of 174 B.C. 'Cadavera, intacta a canibus et vulturibus, tabes absumebat: satisque constabat, nec illo, nec priore anno, in tanta strage boum hominumque vulturium usquam visum' (Dead bodies rotted away, untouched by dogs and vultures: and it was generally agreed that no vultures were to be seen, either in that or the preceding year, in spite of so great a mortality of men and cattle). In this instance, then, it was not that they scented death from afar and held aloof, but that they disappeared beforehand. If some undetected epizootic—say of rats—had preceded the outbreak among cattle and men, the vultures may well have perished at the outset from feeding on infected material.

Other authors extend the observation to birds in general, and not only to birds of prey, as though their affection was truly epizootic. Thus Schenkus² says that in the plagues of 1505 and 1522 birds deserted their nests and young ones. Goclenius says the same of the plague of 1612, and that they fell suddenly to the ground dead. Mercurialis says that Venice was deserted by birds in 1576, and Short repeats this of Dantzic in 1709. Diemberbroeck says that cage-birds died in the epidemics of 1635 and 1636, and Sorbait records the same fact of the Viennese pestilence of 1679. Most, if not all this succession of epidemics, were unquestionably true oriental plague, with or without typhus.

At present there is very little evidence of any extensive affection of the lower animals by typhus. Mosler, many years ago, failed to communicate it to dogs by injecting fresh typhus blood into their veins, or by feeding them on fresh typhus excreta, although death with typhoid symptoms followed, when the blood and stools had first been allowed to decompose. In the last few years experimenters have succeeded in communicating the disease to various monkeys by the agency of lice, but dogs, rats, and guinea-pigs have hitherto proved refractory to infection.

On the other hand, there is abundant evidence of animal infection with oriental plague. Epizootics among rats and cats are well known. Boccaccio asserted the susceptibility of pigs, and Michoud confirmed the observation in the Yunnan epidemic of 1893. Dogs, poultry, deer, cattle, monkeys, squirrels, and marmots have all been shown by various observers to be prone to contagion.

Before accepting the evidence of Thucydides as to the disappearance of birds as weighty evidence in favour of the presence of true plague, one must consider the state of the country district around Athens, devastated by fire and the sword, and denuded of all its stock, so as to offer no promise of sustenance to bird visitors. But even so, one is still confronted by his statement as to the domestic dogs, which are known

¹ xli. 21.

² *Obs.*, p. 870.

to be susceptible to plague and not known to be susceptible to typhus.

Thucydides says that no one was attacked a second time, or if he were the result was not fatal. Immunity of this kind, comparatively complete, is alike characteristic of typhus and plague: the question is one that has provoked considerable controversy right down to modern times. Both Curschmann and Murchison are agreed as to the extreme rarity of relapses and reinfections in typhus: curiously Murchison himself had two typical severe attacks.

In the case of plague, Alexander Massaria,¹ from his experience at Vicenza, came to the conclusion that one attack rendered a man immune with very few exceptions, but that a second attack might be mortal. Mercurialis and Van Helmont were in agreement as to the rarity of second attacks. Diemerbroeck² recorded two cases of reinfection in the same year of the plague at Nymwegen, and several cases at an interval of a few years. During the plague of Marseilles in 1720, various writers observed cases of reinfection, and relapse was also said to be frequent. In the plague of 1771 at Moscow, Samilowitz, prejudiced by his own advocacy of inoculation, denied the existence of reinfection, and suffered retribution for his dogmatism by three relapses in his own person. In the same plague both Mertens and Orraeus recorded cases of reinfection. In the plague of Aleppo Russell noted 28 cases of reinfection within three years among 4,400 victims of plague. Thus the idea of complete immunity, so prevalent popularly both in Europe and the Levant, must be accepted with some reservation.

¹ *Tract. de Peste*, ed. 1669, p. 509.

² *De Peste*, lib. IV, hist. 37. 45.



**Wellcome Library
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and Understanding
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[Tuesday Afternoon, August 12]

SECTION XXIII

HISTORY OF MEDICINE

RESOLUTION

I. 'A proposal was submitted from the Italian Society of the History of Medicine and the Natural Sciences that there should be an International Federation of such Societies. After discussion it was agreed :

1. That it is desirable to have the means of bringing the various Associations of the History of the Medical and Natural Sciences of all nations into direct contact with one another, and to enable them and the individual students of whom they are composed and other persons to follow and keep up to date in the general movement of scientific-historical research.

2. To furnish the Associations and their single members, by means of suitable exchange, with any information that may be requested in regard to scientific-historical research, so that when the student requires enlightenment or advice he may address himself to the institutes of the various countries.

3. By means of the forces united in this way, to encourage the development of historical study of the various sciences, and to make an extended and continuous propaganda for their benefit.

4. To propose and arrange periodical Congresses of all scholars devoted to the study of the History of Medicine and the Natural Sciences.'

II. 'That a provisional International Commission be appointed from the members of the Seventeenth International Congress of Medicine (History of Medicine Section) to carry these resolutions into effect and to endeavour to bring about such a Federation.'

III. 'That the following members form the said Provisional International Commission :

Sir.W. Osler, Bart., Great Britain ; Professor Sudhoff, Germany ; Dr. Wickersheimer, France ; Dr. Capparoni, Italy ; Dr. Djurberg, Sweden ; Dr. Johnsson, Denmark ; Dr. Kleiweg de Zwaan, Holland ; Dr. Streeter, U.S.A. ; Mr. Wellcome, 54a Wigmore Street, London.
Secretary, Dr. Pietro Capparoni, 108 Via del Pozzetto, Rome.'

